The Hoya Handbook

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A Guide for the Grower & Collector

By Dale Kloppenburg

with

Ann Wayman

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PREFACE

Interest in Hoyas as house plants has increased dramatically in the past ten years. Many who started with just a few plants a decade ago, now have large collections. Busy people from all walks of life are discovering the joys of growing Hoyas as a hobby. Unlike so many exotic plants from far away places that must be treated with great care to insure success, these plants seems to thrive on a certain amount of neglect. This is not to say that they don't enjoy being pampered...they do! But they can also get by very well without all the coddling and attention that many tropical plants require.

The question that arises more often than any other from new growers, is...Are there any books available? The second question from new, and not so new growers is...How do I know which Hoyas to buy? The answer to the first question is...that there is very little literature available for the Hoya grower. A rather vague answer! The answer to the second question is even more vague. Until a few years ago, there was really no way of knowing what to buy, or exactly what you would get when you placed an order for Hoyas. It was obvious that a handbook on the care and culture of species in the Hoya genus was needed, and that this book should also contain many colored pictures to help with the selection of future purchases.

I would have loved to continue my research work into the scientific end of this interesting genus, and watched from the sidelines while someone else did the writing. However, nobody else volunteered, so after much persistant prodding from friends and Hoya growers, I reluctantly said...Why Not!

After the first few days of writing, I realized that I was actually enjoying every minute that I spent working on this book. I found myself wandering around the green house, really looking at the plants again...examining individual flowers, admiring the dozen shades of green, bronze and pink of the different foliage. Tracing veins and leaf patterns with my eyes. This is a part of plant growing that I had almost forgotten existed.

I would like to dedicate this book to Hoya lovers all over the world.

... As for me...

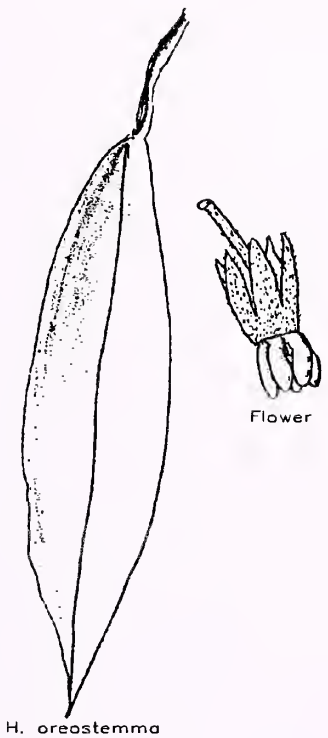
I think I'll just sit here awhile and watch my plants grow!

Dale Kloppenburg

INTRODUCTION

Hoya is a group (genus) of plants that belong to the milkweed family, Asclepiadaceae. The family occurs in the temperate regions of the world. The largest number of species are from the tropics and subtropics, especially South America and Southern Africa. Most have a milky sap. The flowers are borne in cymes, racemes or umbels. Each flower is bisexual (containing both male and female parts), are regularly symmetrical, of 5 partly fused sepals and 5 fused petals. Various classification schemes usually divide the family into parts and subparts. Joseph Decaisne in De Candolle's Prodromus divided the Asclepiad family into 5 suborders. The 5th being Stapeliae; consisting of 2 divisions. Division II Ceropegiae, contains among other genera, Stapelia, Ceropegia, Dischidia and Hoya.

The Hoya genus can be delineated by pollen masses being erect or connivent, lying upon the stigma (the edge of the stigma table), fixed by the base, or beneath the middle of the side. Anthers terminated by a membrane (anther appendage). The genus was named for Mr. Thomas Hoy, the intelligent and successful cultivator of wide renown, who worked for the Duke of Northumberland at Sion House, England. Hoya is the Latinization of his name.



H. oreostemma

Chapter 1

As with many things in nature we cannot be dogmatic concerning the various aspects of this plant genus.

We could say that Hoyas are vines...and the majority are. There are, however, some species that are more like bushes than vines. Most twine and climb up tree trunks or among the branches of large shrubs, but many species are pendant, hanging down over large limbs, exposing their dangling stems to the monsoon winds of the moist tropics. Again...the largest number of Hoya species are found as epiphytes and usually hang in the branches and crowns of tall jungle trees seeking sunlight, yet many start their life in the dampness of the tropic forest floor. Seed, borne on the wind, alight and germinate in this dampness. The climbers find their way up stems, tree trunks and branches to eventually die out below and find life support in the tree tops above. Millions of these seeds germinate, but only a small percentage establish themselves and grow to maturity.

I have seen enormous plants covering the massive crowns of giant forest trees. Vines in profusion...hanging 30-40 feet in a dangling mass from huge primary forest trees. Some species, small in nature may form a compact, clump-like mat on a tree limb.

Though numerous Hoyas prefer limestone ledges, outcroppings or boulders, most are lowland species, even living in the mangroves at sea level. But, here again...some species can be found at high altitudes. In the cool mists and cloud covered mountain tops of the tropical rainforests they enjoy almost constant moisture and high humidity. Intermediate and low elevation Hoyas often exist in an atmosphere where there is no spring, summer, fall, or winter...only a wet or dry season.

Some areas that Hoyas inhabit are extremely dry for long periods of time. Inland from Darwin, Australia, a Hoya may be subject to rainfall only once in 3 to 5 years when the monsoon rain pattern changes, and a storm sweeps inland to these areas. Under these dry conditions, the plants develop thick, succulent leaves that are capable of storing moisture for survival until the next supply of water arrives. In fact, most Hoyas have rather thick leaves and can be considered succulent in nature. But, once again...there are exceptions, and we find a few species that have very thin leaves. The range of diversity in foliage seems to run from thin and fragile, to very thick and succulent. In habitat...from seashore to high tropical mountain tops. In growth habit...from vinelike climbers to bushes, shrubs, and graceful pendant forms. I would also like to add, from wee flowers, barely visible, to huge flowers over three inches across.

In the course of my own collecting trips, I have found that most hoyas seem to prefer the edges of the darkened forest where there is some light, yet not the open areas of scrub and grass where the sunlight is intense. As was mentioned above, there are exceptions such as the dry regions of North Eastern Thailand, and the desolate territory inland from Darwin Australia. Traveling stream courses is especially productive in yielding Hoya specimens, but also the edges of cultivated fields and most often, but not exclusively, on old primary forest trees. In these trees, often isolated in many areas due to forest destruction, we often find one or more Hoya species flourishing in the crown or twining among the aerial roots and gnarled trunks. Areas where trees have been cut for timber or slash and burn agriculture, power line clearing and other such human undertakings, are excellent places to find mature plants, and usually many seedlings among the moss, broken limbs and rotting wood. The area where I found the most extensive growth of Hoyas, was in a cultivated field of Taro, growing profusely among the rotting trunks of forest giants, and on adjacent small trees left for shade, on the island of Upolo in Western Samoa.

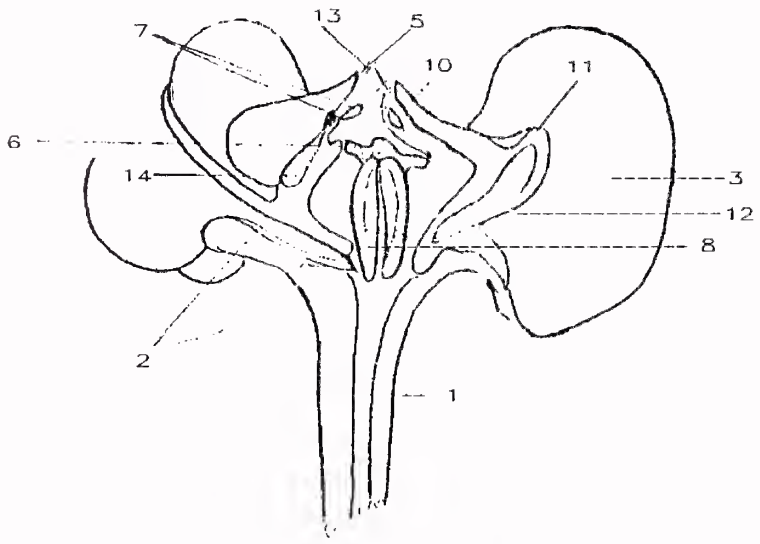
In our collecting endeavors, we must always keep conservation in mind, and not strip whole plants away, but leave major portions to continue their growth. We can, after all, make a herbarium specimen from a small portion of a plant, and even grow thousands of plants in the course of time, from a one node cutting brought in from the wild. In areas that are destined to be burned, it is another matter. Plants exposed to the direct rays of the sun with their shade canopy destroyed, will not survive for long, but often long enough to flower and fruit...in human terms, a desperate attempt at species survival, a one more time effort to reproduce before death. There is no intelligent intent on the part of the plant, only a response to physiological conditions.

Chapter 2

>>>>>>>>>>>> Lands of Discovery <<<<<<<<<<<<

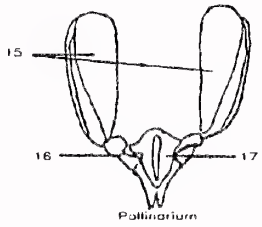
Hoyas are found in many exotic places. Their westward extension is on the island of Sri Lanka (Ceylon), off the South Western coast of India. They are found in peninsular India, the upper Ghats region, the Punjab, Simla and Sikkim, around Kolimpong in the foothill region of the Himalayas, and to the East in the Kasi and Naga hill country. From here Eastward into Burma, Thailand, Southern China, Laos, Cambodia and Vietnam. There are species found on Taiwan and the island of Okinawa south of Japan proper. Numerous species have been discovered in New Guinea, and also the Philippines with its 1400 islands. Another large collection area is Sumatra, Malaya, the islands of Indonesia, Borneo, and the Celebes. In Australia around Darwin facing the Arafura Sea, on to Cape York and down the East coastal areas south to Northern New South Whales. From the Australian Mainland and across the Main island of New Guinea they are found on all the lesser islands of New Ireland, New Britain, Bougainville and on down the islands of the Solomon chain, and South to Vanuatu (New Hebrides) and New Caledonia. They are at home even further to the East in the many islands of the Fiji group, on to Tonga and the Samoan Islands. In the American Trust territories, one species each are found on the islands of Truck and Ponapae.

In all this vast area there are islands, valleys, mountain slopes, and hidden canyons where Hoyas have not yet been collected. Our chances of discovering new species is certain.

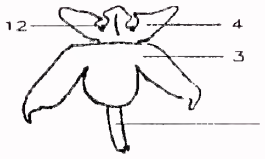


Cross Section of Flower

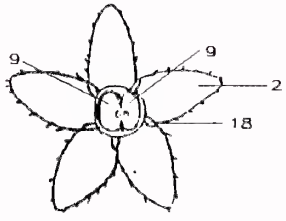
1. PEDICEL
2. CALYX (Sepal)
3. COROLLA
4. CORONA
5. STIGMA HEAD
6. STIGMA receptive area
7. POLLINARIUM
8. OVARIES
9. OVARY
10. CORONA inner lobe
11. CORONA outer lobe
12. CORONAL GROOVE
13. ANTHER wing
14. ANTHER appendage
15. POLLINIA
16. TRANSLATOR
17. RETINACULUM
18. LIGULE



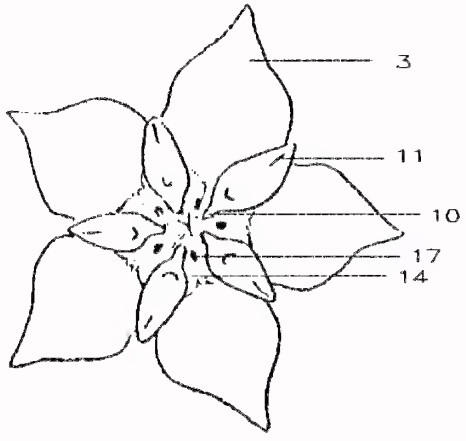
Pollinarium



Side View of Flower



Top View of Calyx w/Ovaries



Top View of Flower

Chapter 3

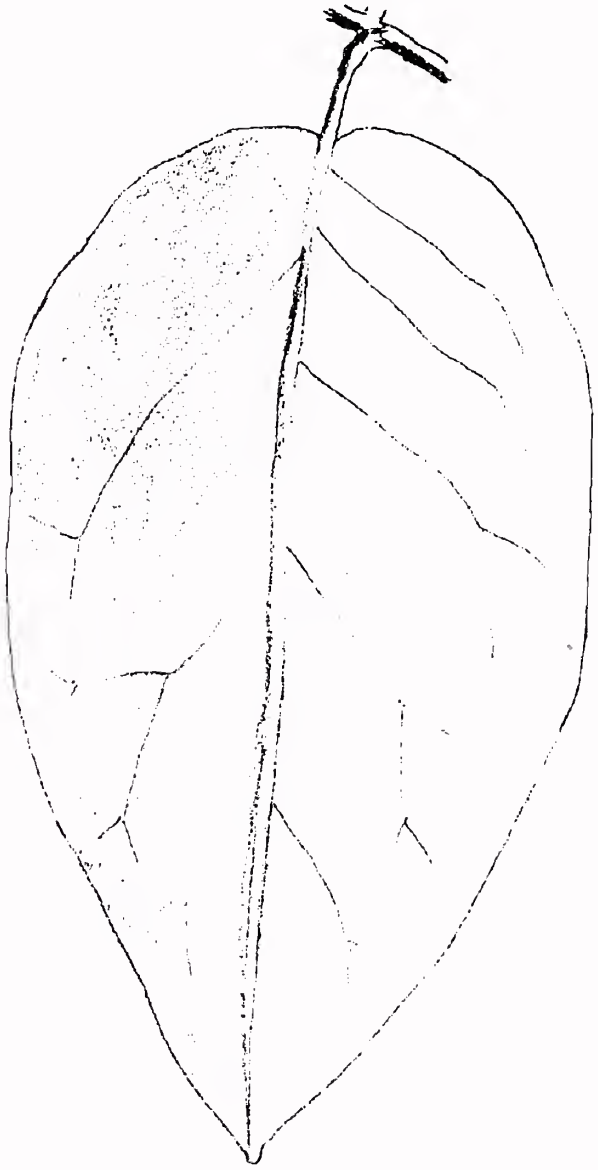
>>>>>>>>>>>> Foliage & Flowers <<<<<<<<<<<<

Until recently there were only a few Hoya species available for the plant lover to enjoy. Within the past 10 to 15 years, a well deserved interest in this genus has led to a flurry of collecting, and the available species and clones has grown year by year. It is a continuing quest that is interesting, educational, a boon to the conservation of these species and above all exciting. I'm sure most will agree this is a group of plants that are beautiful, exotic and well worth your devoted attention and study. Even when not in bloom the well cared for plants exhibit beautiful foliage, each species different in color, texture, shape and markings. It is always a joy to observe the development of the new growth, often with bronze, maroon and reddish tones of color.

Most Hoyas have opposite leaves, two at each node, but again we have an exception in the case of the H. imbricata complex. One leaf of these species aborts or does not develop and the remaining circular leaf oppresses itself closely to the trunks of Palms and other forest trees, most often with one leaf overlapping the next, shingle fashion. This gives rise to the specific name of "imbricata" which means overlapping. The stem is usually covered by these cupped leaves under which are many rootlets. This is an ideal hiding and nesting place for ants which take full advantage of a place to call home. Thus in many cases a colony of small ants can be found here (a sort of symbiotic relationship). Actually, if you pull a plant off of the tree trunk, "the ants will find you". The plant winds its way up the tree trunks often almost completely covering the surface, orienting themselves to the preferred amount of light, moisture and exposer to the jungle breezes.

All Hoya flowers are a study in perfection; starlike in appearance with their five petals, and a gorgeous central crown that sits atop the flower like a queen's tiara. Described by many as "molded in porcelain", "sculptured in wax". One of the most beautiful of nature's creations, and all but a few have a lovely fragrance. The

inflorescence on most Hoyas consist of 20 to 30 flowers per umbel. While some species will have as many as 50 or 60, others have as few as 2 to 4. The larger flowered species usually have fewer flowers, but make up for it in sheer magnificence.



H. calycina (leaf)

Chapter 4

Care & Culture of "The Stars"

>>>>>>>>>>>> Propagation <<<<<<<<<<<

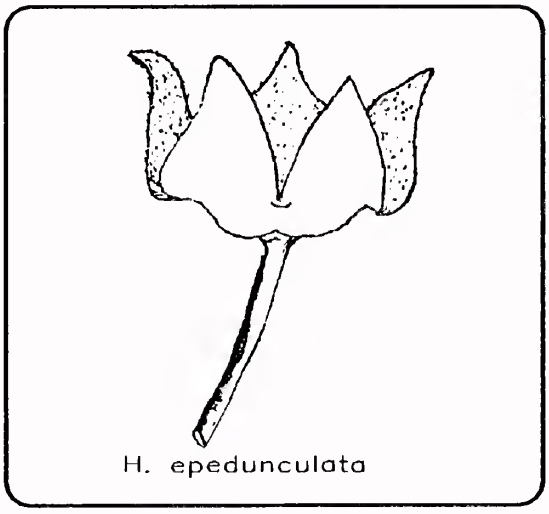
In the process of collecting rare and exotic plants, there are times and under some conditions that seed pods are collected. The seed is sown and the resulting plants are grown on to maturity. In the case of Hoyas, virtually all of the species that we have under cultivation today were originally brought in from the wild as cuttings. These long pieces of plant stems, hopefully, with some leaves still intact, were cut into smaller pieces, just below a leaf node (or growing point), and rooted in many different mediums, ranging from plain water, to sand, and all types of mixtures in-between. This form of multiplying plants is called "vegetative propagation", and results in a plant genetically identical to the parent plant. Our Grandmothers used to call these cuttings slips, and to "slip a plant" meant only that it was being propagated from a cutting.

Hoyas are one of the easiest of plants to propagate from cuttings. It is possible, however, to fail to get a cutting to root, so a few suggestions may be helpful.

When plants arrive in the mail, they may be dehydrated, or highly stressed, and will benefit from a soaking for a few hours in mildly warm water, to which a little table sugar has been added. Although the sugar helps to give the cuttings extra strength and some food reserve, the amount of sugar isn't as important as getting moisture back into the leaves. A quarter cup of sugar to two gallons of warm water should be adequate. Even adding a few drops of Vitamin B-1 won't hurt. This process helps to keep your cuttings from further wilting and so increases your chances for survival until they can form a root.

>>>>>>>>>>>> Rooting in Water <<<<<<<<<<<<

Let's start with water as a rooting medium. If you're rooting many cuttings at a time, a pint size, wide mouthed jar, filled with tepid water works well. A short, narrow necked vase is best for one or two cuttings at a time. Wrap the jar or vase with aluminum foil to keep out the light. Extending the foil above the mouth of the jar, and tucking it over the lip to make the opening narrower will also help to hold the cuttings upright. You won't need to do this with the vase. Long cuttings lose moisture from the leaves and stems by a process with a jaw-breaking title of "evapotranspiration", or to put it simply, by evaporation and transpiration leading to wilt. So keep your cuttings as short as possible. In most cases a 6" cutting is ideal, but not always possible with Hoyas that have very long internodes between leaves. On cuttings that have their leaves close together, remove the bottom layer of leaves so at least one node, minus the leaves will be under water. It is in these growth points, or nodal areas where the growth hormones are concentrated, so you will usually get a root in 4 to 10 days. A light dusting of a root hormone powder, or a drop or two of vitamin B-1 solution may hasten rooting. The idea is to get a good root system as quickly as possible with little or no wilting. Place your cuttings in lukewarm or tepid water and keep in a well lighted, warm, humid area. If the cutting is wilted or the humidity is naturally low, you may need to place a poly bag loosely over the top of the cutting and jar. Cut a small corner from the poly bag to allow steam to escape in case the room heats up to a point where the cuttings are in danger of being cooked from the heat that forms inside the bag. As soon as you see a strong root system develop, it is safe to "pot up" the plant in a soilless or soil based medium.



>>>>>>>>>>>> Rooting in a Solid Medium <<<<<<<<<<<<

When rooting in sponge rock, sphagnum moss, fine bark chips, loose potting soil or other moisture holding media, it is necessary to keep the medium moist but not sopping wet. The mix should be loose enough, or be of such texture as to provide moisture, while allowing all excess water to pass on through (good drainage). Be sure the medium and container are sterile! As with the water method, a rooting hormone or vitamin B-1 will also aid rooting in other mediums. Most rooting hormones also contain a fungicide which will counter-act any soil born fungus diseases that may be lurking in soil based mixes. Hormones are not essential, however. People have been rooting cuttings with almost 100% success since long before hormones were marketed, so don't let a lack of hormones on hand deter you from rooting new cuttings. Small leaved hoya cuttings are handled differently than the very large leaved types...the intermediate types fall somewhere in between. For the tiny miniatures, ten nodes, or more may make a good cutting and still be relatively short. Some of the large leaved, heavy stemmed Hoyas may arrive at your home with only one set of leaves, or, as is sometimes the case, only 1 leaf. With these large leaved species, a single node makes an adequate cutting. In these circumstances, the stem, with the leaf attached is pushed into the medium to just cover the node, leaving the leaf blade in the open air. Here is where setting the cut into the medium at an angle aids in doing it correctly.

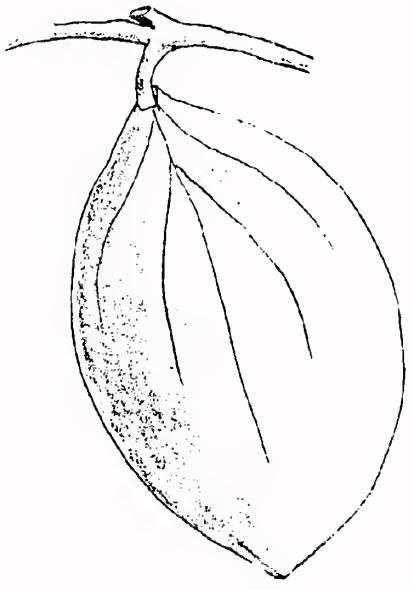
In some very extreme cases (such as traveling long distances by mail) plants will arrive with no leaves whatsoever. Don't despair! A plants' ability to live has always been a puzzle, and nowhere is it more prevalent than in this instance of bringing a half dead plant back to life. Plant these leafless stems in the same manner that you would plant a stem with leaves. If they are going to recover and live, they normally form a tiny leaf, or leaf bud first, then a root (this phenomenon is quite typical in Orchids.) Once the root is established and growing, the leaf may dry up and fall off, but, don't give up! This seems to be a normal process, and if there is a shred of life left in them, they can usually be saved. You can usually tell whether stem cuttings have developed a root by their outward appearance. They look plumper, and are a healthier looking green or sometimes even brown, but they don't have that "sick to death" look of cuttings that are dead, but refuse to fall over. As long as the root system is alive, the plant will eventually begin to grow, often producing new shoots directly from the roots. This may take a few days, or a year or more, and you might want to consider whether it is worth the trouble. With very rare or expensive cuttings, it is certainly worth every effort. Don't be tempted to lift any cutting to see what is happening, and don't bump or move the stem. Leave them in a warm, humid, well lighted spot, and ordinarily in 2-3 weeks you may expect to see the beginnings of new growth.

Leaves from Hoyas will root, but seldom if ever form into plants. Adventitious buds must first form to produce a shoot and new leaves, this seldom ever happens! I believe, however, with some manipulation and scarring of the callused area and the addition of a shoot hormone, growing plants from leaves might be possible.

Continuous mist systems: with very loose materials i.e. sponge rock, loose coral etc., a continuous fine mist or an intermittent misting to keep the cuttings continuously damp will promote rooting. All excess moisture must drain away. It takes some preparation to devise this set up but it is almost fool proof. In a way this is similar to the water method.

HINTS: (1) Always have at least 1 node buried if possible. (2) keep cuttings short. (3) If you have several cuttings of a plant, try them in different rooting mediums. (4) Lay cuts of small species horizontally with a node or two covered. (5) Make fresh, clean cuts before applying rooting hormone, and blow or thump off the excess. (6) Bottom heat of 70 degrees fahrenheit will hasten rooting. (7) Keep the humidity high to reduce evapotranspiration and the subsequent wilting of the leaves, until rooting begins in a day or two.

One final note: Remember which end is up and which is down. The growing end does not like to be buried. It may root but new growth will be slowed until the cutting has had time to re-orient itself.



H. dolichosporte

>>>>>>>>>>>> Growing from Seeds <<<<<<<<<<<<

If you are lucky enough to live where Hoyas will produce pods, you can collect the seeds and sow them. Hoya seeds lose their viability quickly over time, so the fresher the seeds, the better your chance of success. These fresh, mature seeds will germinate easily on a damp medium. A commercial seed sowing mix can be purchased, or your seed can be sown on a bed of fine peat moss, clipped sphagnum, or fine potting soil. If you like to experiment, synthetics, such as moist blotting paper, burlap or fine tissue can be used to germinate your seed. The best of these will pull free from the tiny sprouts when you are ready to separate and pot up the individual plants. The greatest danger other than becoming dry is "damp off", a fungus disease that attacks seedlings at the soil line, causing them to collapse and die. It is a good idea to spray the surface of your seed bed ahead of time with a good systemic fungicide. Benlate, (Benomyl) mixed according to directions, is excellent.

Snails and slugs can wipe out an entire tray of seedlings... in one night! If you suspect that you have these pests in the near vicinity, get out the slug bait!. Keep your seedlings moist, warm, and in good light. If you have potted up your seedlings into a regular potting mix, they will need no fertilizer for several months...perhaps as long as a year. If, on the other hand, you have used sponge rock, vermiculite, or other soilless mediums, you should begin a moderate feeding program as soon as the seedlings display two sets of regular leaves. Many seedlings have been burned back or killed by fertilizer, so feed with a light hand. One tenth the strength recommended for mature plants should be adequate for these tiny babies.

Fertilizer is not a cure-all. It won't cure a diseased plant. In fact, only healthy plants in active growth should be provided with additional nourishment, unless the plants' illness can be diagnosed as lack of nutrition.

>>>>>>>>>>>> Light Requirements <<<<<<<<<<<<

Light is the very essence of life for all plants. It regulates the three essential processes for growth and development. Photosynthesis, as discussed earlier, is the plant's procedure for converting light energy into food energy.

Phototropism refers to a plants' natural tendency to grow toward their light source. This process is controlled by growth hormones (auxins) in the stem tips and youngest leaves. These auxins are highly reactive to light and cause the plant to adjust itself toward the brightest light source.

Photoperiodism is the plants' natural approach to its' light and dark cycles. To put it simply...a plant performs best in the same cycle of light and dark periods which most closely resemble those of their original habitat.

Fortunately for us, Hoyas seem to grow, and even bloom without regard to the length of their day...provided of course, that there is a definite period of light and darkness.

In areas where plants can be grown outdoors in a moderately shaded setting, this is usually no problem...the light comes on in the morning when the sun rises, and goes off at night when the sun goes down. The same principal applies in a green house...the plants get an adequate amount of light and darkness, and thrive with little, or no intervention on our part, other than to make sure that they don't suffer from lack of water.

Growing Hoyas or any other plants in our home takes a certain amount of planning. There are many determining factors that dictate how much light is available within a home. Even in the same room, light intensity can vary drastically from one location to another. Each changing season brings a different angle and intensity to the sunlight that enters our homes through windows. We need to determine well in advance whether the proper amount of light is going to be available on a year-round basis.

"Bright indirect light" is an appropriate description of the light required for good growth and bloom by almost all Hoyas. There are a few species that actually prefer a shadier location, just as there are some species that prefer almost full sun in order to grow and bloom well. Watch your plants closely...they will usually let you know by their appearance whether they are happy, or just barely surviving.

>>>>>>>>>>>> Food For Your Plants <<<<<<<<<<<<

Plants in the wild are ragged, mixed with yellowed, insect chewed leaves, dead and dying stems, and usually, leaves that are smaller and thicker than cultivated plants. The transformation to culture is often amazing, and proves that our cultivated plants certainly get more attention and loving care.

Every living thing on our planet requires food for energy. The essential elements for health and growth are sugar and other carbohydrates. Unlike animals, however, plants utilize the energy of the sun to manufacture their own food, through a process called photosynthesis.

In photosynthesis, light energy, carbon dioxide, and water combine with the green plant pigment, chlorophyll, to produce plant sugars and oxygen, which is released into our atmosphere.

Photosynthesis requires an environment with a sufficient amount of light, warm temperatures, and the proper amount of humidity.

So called "plant foods" can never compensate for a poor environment, since fertilizer provides only the nutritional building materials, not the plant's real food...the sugar it manufactures by photosynthesis.

The organic decomposition of peat moss, sphagnum, bark and other plant potting media will provide your plants with a lot of their nutritional "building blocks". In nature, we have decomposed bark, litter, dust, animal manure from birds, bats, ants etc., even rain water contains nitrogen the most essential element in plant nutrition. These provide the necessary nutrients, but we want our home grown Hoyas to look better than plants struggling in the wild, so we protect them from the wind, the driving rains, the scorching sun...and we try to provide them with any minerals that they might be lacking. The question that arises is what is necessary and what is excess. Too much fertilizer, and we have a dead or badly burned plant. Good common sense tells us to use fertilizers judiciously, and on potted plants in weak solutions or concentrations. If the plant is continuously in growth it needs a constant source of food. The plant takes up nutrients in the form of ions and can not tell the difference between organic and inorganic sources. They also can not tell the difference between cheap and expensive substances.

Lets look at plant nutrition and nutrients closely. Of the more than 100 chemical elements known to man today, 16 are known to be essential for plant growth. Others may eventually be found to play some role in plant growth or function in very minute amounts. Many of us would mentally skip over the 3 major ones (carbon, hydrogen,

and oxygen) because they are so common. In a sense, they are "free" because they are taken from the air and water. The 13 other essential elements are normally absorbed from the soil by the root system, or to a lesser degree, by being absorbed through the foliage, such as in foliar feeding. These 13 elements are divided into primary, secondary, and micro plant nutrients, and are separated into these divisions on the basis of the relative amounts required for plant growth. None is more essential than any other, regardless of the amounts required.

Briefly, carbon is a basic building block for plant life. It is taken from the air in the form of carbon dioxide. Photosynthesis combines the carbon with hydrogen and oxygen to form carbohydrates. Oxygen is required for plant respiration, and hydrogen, along with oxygen, forms water, which constitutes a large portion of the total plant weight. This water is required for the transport of minerals and plant food and the chemical reactions necessary for plant growth.

The primary plant nutrients are nitrogen, phosphorus, and potassium. Most of the nitrogen is taken up by plants in the nitrate form (negative ions or the chemical formula NO-). The phosphorous is absorbed as HPO-, HPO =or PO =, depending on the soil pH (its acidity). Plants take up the potassium in the form of a positive ion, K+. In the fertilizer we purchase for our Hoya plants, the various 3 numbered formulas on the labels, e.g. 8-24-10, 12-36-14, 20-20-20 etc., stand for these 3 primary nutrients, nitrogen, phosphorous, and potassium, and, in that order as N P K and represents the percent by weight.

The secondary plant nutrients are calcium, magnesium, and sulphur. The 7 micronutrients are zinc, iron, manganese, copper, boron, molybdenum, and chlorine. Balance is important in plant nutrition, and our objective should be to supplement the capacity of our potting mix to supply nutrients for ideal growth and flower production.

There are many choices for the consumer. Keep in mind what you want, what you are getting, and what price you are paying. In most instances you need only supplement the nutrients already present. It may be well to occasionally supply micronutrients. Though the majority of the better known brands of specialty plant foods contain these micro-nutrients, they are usually quite expensive, as they are packaged in small quantity. On the other hand, huge bulk sacks of plant food may go to waste if it takes years to use. Foliar sprays and slow release fertilizers also have their place. The former for quick response and the latter because they need be applied so infrequently. Many growers will apply a high nitrogen fertilizer in the spring when rapid growth is desirable, then switch to high phosphorus in the fall when growth slows in order to promote bloom, and to harden off the plants for the cooler winter months.

>>>>>>>>>>>> Temperatures <<<<<<<<<<<<

Temperatures for the individual species will be covered more thoroughly in our Hall of Fame. For now, let it suffice to say briefly that all Hoya species are considered either tropical or semi-tropical. Though some few species can survive a light freeze for a short time, most will not survive if exposed to temperatures below 50° F. (10° C) Many will die if exposed to temperatures under 60° F. (15°C.). When we live in areas of cold winters and without heated greenhouses we have learned to be window sill gardeners, basement gardeners, and plant room gardeners (some plant rooms are situated in attics), and all under that wonderful artificial light called "flourescent".

>>>>>>>>>>>> Artificial Light <<<<<<<<<<<<

Hoyas can be grown and will flower beautifully under artificial light. The small growing species are especially valuable for this method of growing. There are many types of light stands available, some employing very elaborate and expensive grow lights. The research done on this form of growing indicates that nothing elaborate is required. A simple table or shelf with some way of hanging lights fairly close to the plants is all that is needed. Inexpensive shop lights with flourescent tubes work just as good as any other. It seems to be the number of hours spent under the lights each day that determines how a plant will grow, rather than the quality of the light. You will need at least two 4' long, 40 watt tubes, as the smaller 18 and 24 inch tubes don't put out enough watts for sufficient growth. If you're trying to grow plants with flourescent light as your only source of light, keep the lights on a minimum of 12 to 14 hours per day. They will, however, need a rest period of total darkness to give them a chance to manufacture the starches and sugars that they require in order to grow well. A small inexpensive timer is handy, and can be set to keep the lights on for whatever time you select, then off for the allotted amount of time. If you have some light coming through a window, you might want to use the flourescent lights a few hours a day only, or as a supplement during the dark overcast days of winter. This constant source of light will result in steady, even growth and your plants may require more water and fertilizer than they would normally need.

The one flaw to growing under lights is that some species (not all) will develop red or rust colored blotches on the foliage. This is not a harmful condition, but not very attractive, and is thought to be caused from heat build-up. To prevent this, keep a small fan blowing close to your light growing area so that the air is kept in constant motion.

>>>>>>>>>>>> Potting Medium <<<<<<<<<<<<

Commercial "all purpose" potting mixes are readily available, convenient to use and for the most part contain ingredients suitable for the majority of house plants. Peat moss is normally the foundation or base ingredient of most house plant mixes with other organic additives such as ground bark, sterilized manure, composted leaf mold, rice hulls etc. In addition they will contain gritty substances for aeration such as coarse sand, pumice, perlite or vermiculite. If you read the ingredients on the side of the bag, you will usually see that a certain amount of dolomite lime has also been added...this is to neutralize the acid in the peat moss and helps to maintain a neutral, or very slightly acid condition in the mix.

If you like the idea of mixing your own potting medium, or experimenting with various additives, all these ingredients can be purchased separately. You may even want to use your own garden soil which is perfectly acceptable. The organic matter in soil is systematically broken down by microorganisms and forms humus. Humus is that dark, crumbly material that colors the soil and allows it to hold air, water, and nutrients. Adding organic amendments such as peat moss, dried manure, ground bark, leaf mold, or compost will improve your garden soil. After combining this concoction together thoroughly, it should be sterilized...or rather "pasturized" in your oven...use a covered container, and bake at 180 degrees for an hour or so to kill soil born pests, weed seeds etc. You will also need to check the pH (acid or alkalinity ratio) of your mix with a testing kit, and add dolomite lime to bring the pH of your soil to approximately 6.9 which is considered very slightly acid...7.0 being considered neutral.

Without getting too deep into the acid/alkalinity dilemma, it is sufficient to say that the majority of Hoyas do best in a mix that is neutral, or slightly acid. On the other hand, there are many Hoya species that are adapted to limestone areas, and will benefit from chunks of crushed coral, limestone, bits of sea shells, or marble. Anything that will provide calcium carbonate. Oyster shell is readily available, and can be purchased at any feed store. It is the same product that is fed to chickens and turkeys for added calcium in their diet.

>>>>>>>>>>>> Pots and Potting <<<<<<<<<<<<

Many of the Hoyas in nature are epiphytes...most in fact!. True epiphytes, such as Bromeliads, Tillandsias, and some Orchids, spend their entire lives on large trees, high up in the forest tops. The seeds drift on the wind or can be carried on the fur of small animals, or distributed by birds. Seeds that alight in the debris that collects in the crotches of branches, will germinate, and there they remain, never touching the ground. Hoyas are considered epiphytes, but usually start their lives connected to the ground. They may grow for some time scrambling over bushes, and climbing into small or sometimes, very large trees. Their climbing and vining habit makes them extremely adaptable, and although they may start their life on the ground, if the long, tip end of the vine reaches a tree, it will grab on and begin to climb. As a rule, the base of the plants eventually die out, and the plant becomes an epiphyte. If the trees are growing close together, we may find the same plant growing through the branches of several trees.

We may duplicate this growth type to some extent, if we have the room...say a greenhouse, if it's large enough, or outdoors in tropical areas. This works best with small to medium sized species. Find a suitable section of tree trunk or limb and wrap it with sphagnum, burlap or other material to retain moisture and for a place to affix your cuttings (a place of support). Stick rooted cuttings in at various places and secure them with plastic floral tape, hair pins or other holders. In areas of intense sunlight throughout most of the year, these plants will do better on the north, shaded side of the trunk. If on the other hand you live in an area of many dark overcast days or coastal fog, your plants will probably be happier in a south-east exposure. Once established, many Hoyas will thrive in this condition, and even enjoy sharing space with other epiphytyes. It is almost impossible to overwater plants in this situation. They will however, need watering almost daily in summer, and in areas of low humidity.

Although our old standby...the heavy "terra cotta" clay pot is still popular and used extensively for the "really big" species, plastic pots are preferred by most growers for obvious reasons. They are easy to clean and sterilize for re-use, they are lightweight and easy to store, they can be purchased in square shapes, which means that more will fit in a given area. They are relatively inexpensive, and moisture retention is better, which can be a plus or minus. In recent years, we have also had a selection of pressed fiber and styrofoam pots. Most Hoyas, even the heavy stemmed, strong growing ones can be started in a 4" pot. If space is a consideration on your cutting table, two or three cuts of the same clone may be started in the same pot, and separated into individual pots at a later date. Large vigorous species like H. diversifolia, meliflua, obovata, macrophylla, latifolia, polystachya, kerrii, and fraterna may be moved directly to a 6" pot or hanging basket

if you prefer...just be careful of overpotting! It is usually better to wait until the plant growing in a 4" pot shows signs of being rootbound to move it to a larger pot. When repotting, make 2-4 vertical slices through the root ball to provide ends from which the new roots will start. Repot with fresh mix around this root mass and bury just below the new soil line, firm the mix and water thoroughly. Place in subdued light for a week or so, then gradually move into better light.

Cuttings of small growing species, and seedlings of all types should be handled differently, in that seedlings should be transferred first into 2" pots at the 3-4 leaf stage, and later, as they become established, to successively larger pots. Cuttings of the very tiny miniature species can be potted up, three to four cuttings per 4" or 5" pot, where they can live their entire lives. They will require fresh potting mixture occasionally, but will not need a bigger pot. All that is necessary is to remove the plant from the old pot, shake or wash off the old, depleted potting mixture, trim off any dead roots, and place in fresh potting medium in a clean pot of the same size. Do not isolate plants in small pots. They will be easier to attend to, and keep watered if placed close together. This will also help to raise the humidity in the area.

Here are a few basic rules which should always be followed: (1) Don't overpot (2) Use a sterilized medium (3) Use sterilized pots...in other words, keep it small and clean!

In order to look their very best in containers, bushy plants like H. multiflora, cumingiana and the closely related H. densifolia...gracefully pendant forms such as H. bella and polyneura, and the hanging and dangling types, such as H. tsangii, and nummularioides need a container of a different type. Wire baskets lined with moss, then a layer of burlap or fine mesh material to hold in the soil mixture makes an especially attractive display for these types of plants. As they grow and mature they may root on the damp moss along the sides and even send runners out the sides and bottom.

H. serpens, a small creeping species from the cool Himalayan regions, places swept by monsoon breezes, seem to prefer a shallow container kept moist and shaded. A cool, semi shady spot under a bench seems ideal. On a moss covered log, it will grow over the edge and dangle down. Tree trunks and horizontal limbs in semi shade are ideal situations for this and other small species, and are especially appealing to our desire for a natural setting.

Chapter 5

>>>>>>>>>>>> Hang-Em-High <<<<<<<<<<<<

Immediately striking you with their brilliant display of dazzling flowers, gorgeous foliage, and dramatic form, Hoyas on display take on a special perspective when suspended in the air. Hanging gardens are not a novelty, as they have been around for thousands of years (Remember the Hanging Gardens of Babylon). In growing hanging plants, you need not abandon any of the basic techniques used in container gardening on the ground. All you will need is an overhead support from which to hang your plant...and a hanger. Inspiration can help to select the site...imagination can help to construct the hanger.

>>>>>>>>>>>> Selecting the Site <<<<<<<<<<<<

There are many possibilities outdoors for hanging plants. If you already have a particular plant in mind, or several that you want to hang, consider these factors when choosing a location for your hanging garden: Make sure the supporting structure is strong enough to support both the plants and their containers; nature's elements such as sun, wind, and shade, and above all...whether the location is convenient for you.

All Hoyas love early morning sun. Try to pick a spot that gets full sun from about 7:00 A.M. to 10:00 A.M., then bright shade the remainder of the day. There are some few Hoyas that can take more sun than this. H. cumingiana for one seems to prefer considerably more sun than others, but even with this one, it is best to expose it gradually to a sunnier position, rather than all at once.

The dry winds of summer can play havoc with a hanging plant. Not only can it dry out the potting medium extremely fast, if the humidity is low the foliage can lose

moisture faster than it can absorb it from the roots, leading to severe wilt. The thinner leaved plants will usually recover as soon as it cools off in the evening...the thick leaved plants don't recover so easily. Mist your plants often during extremely hot, dry weather. The wind can also get a hanging plant to swinging so energetically, that it comes crashing to the ground. In spite of these hazards, Hoyas do love the outdoors, and even most of the stubborn bloomers will reward you with a shower of blossoms after a few months outside.

>>>>>>>>>>>> Along a walkway <<<<<<<<<<<

One of the most beautiful settings for H. compacta (the Indian Rope Hoya), and the Hoya known as H. Krinkle 8, is hanging from the eaves of a wide walkway or balcony. These plants are similar in appearance, and both have stunning variegated versions that add even more value to their use as hanging plants. H. compacta has tightly twisted and contorted leaves, and looks best if three or four plants are placed in a very large pot. This is one Hoya that seems to like being overpotted, and will quickly grow into a lovely specimen plant with a beautiful cascading habit. The H. Krinkle 8 may be one of the most desireable of all Hoyas for use in a hanging garden. The foliage of this plant flows out of its container and cascades gracefully over the sides like a waterfall. Both of these Hoyas are excellent bloomers, and fairly cold tolerant compared to other Hoya species. Don't leave them out if the temperature is going to drop below 45° F. (7° C.).

>>>>>>>>>>>> Entries and Porches <<<<<<<<<<<

What could be a more welcome sight for your guests than a pair of Hoyas suspended from the overhang above an entry or porch. They could also frame a door or window, or counterbalance low growing shrubs. Make sure that plants hung in these areas don't interfere with traffic patterns or create unnecessary obstacles.

>>>>>>>>>>>> The Patio or Terrace <<<<<<<<<<<

If you have a shade roof or a wide overhang above your patio, you have the ultimate hanging garden display case. There is no other location where plants can make such an impressive impact. You can lay on the lounge and watch them grow. You can eat your meals among your plants (breakfast is nice). A shady patio with a porch swing, and lots of green growing plants is a welcome and peaceful setting

after a hard days work...and because patios and terraces are an extension of the house itself, your plants are always just a few steps away and can be enjoyed from inside or outside.

Always keep an eye on the weather, and remember that the majority of Hoyas are basically tropical plants from countries where temperatures seldom drop below 60° F. (15° C.). Have a place inside ready for warmth loving species in case the temperature drops suddenly. This can be the floor of a spare bedroom, a utility room or any other place inside where the temperature can be kept above 60° F. (15° C.). Hopefully, This is merely an emergency situation and won't last long. In any case, you will need to prepare a more permanent location indoors as Summer fades and Fall approaches.

>>>>>>>>>>>> Hanging Plants Indoors <<<<<<<<<<<

Plants in decorative hanging containers are the perfect accent for the kitchen or breakfast room. They provide a garden atmosphere, and offer a feeling of tranquility to the usual morning rush.

Most modern kitchens nowadays have at least one large window... usually over the sink. Ideally, this window should also face east where it will have the benefit of the first rays of the morning sun. If however, your one and only kitchen window faces a different direction and is far from the sink, it can still be utilized as a setting for a hanging garden.

Select your plants for these areas with great care. Keep in mind that your kitchen is the busiest place in the house, so you won't want a plant with a huge spreading habit, nor one that constantly dangles in everyone's face.

If your windows face south or west, the sunlight close to a window may be too intense. Before locating your plants in or near a window that receives direct sun, consider putting up a sun shield of some sort. This device can be as simple as a thin curtain, venetian blinds, or a folding, dressing room privacy screen. Or...choose a location off to the side of a window, where it will receive light at an angle instead of head-on. Do watch your plants! Pale, dull looking foliage may indicate that it is receiving too much light, while weak, spindly growth, and dropping leaves are a sure sign of inadequate light.

In the Hoya genus there are many species that are considered miniature and semi miniature in size. H. lacunosa is a small growing plant that prefers the subdued light from a north, or northeast facing window, and loves the warmth and humidity of a

kitchen or bathroom. The unidentified species labeled H. sp. Kutching Borneo (IML# 232) is another ideally suited plant for these conditions. There are numerous others that will do equally well, but it may take some experimenting on your part to find the perfect plant for that perfect spot.

If your window faces east, you have a very large selection from which to choose. Virtually all Hoyas will do well in this situation. Your main concern will be in the eventual size of the plant. Never forget that there are literal monsters in the Hoya genus that can grow to 60 feet tall with a spread of 4 or 5 feet across, and have stalks the diameter of broomsticks. They can weigh up to 100 pounds or more, and are better suited to a container on the ground. Among the giants are: H. meliflua, H. fraterna, H. kerrii, H. obovata, H. macrophylla, H. polystachya, H. diversifolia, H. meredithii, H. fuscomarginata, H. imperialis, and the plant known as H. diversifolia B. Remember also that several of these exude a thick black nectar that can actually ruin furnishings and rugs. These are just a few of the largest of the known species. There are many that are borderline, and although they can grow very tall, the stems are thinner and thus more flexible and suitable for twining around a hoop or otherwise tamed to fit the available space.

>>>>>>>>>>>> The High Wire Act <<<<<<<<<<<<

Now that you have selected the plants, and chosen the location, it is time to consider the container, and by what method it will take to the air.

Containers can be anything from the nursery pot that the plants were purchased in, to all kinds of fancy ceramic pots made especially for such plantings. Containers are for eye appeal alone, and there is nothing to limit your choice except lack of imagination. One word of advice...be careful of planting directly into pots without drainage holes. It is much wiser to allow your plant to remain in a pot with good drainage. You can always set this pot down inside of an ornamental one with a layer of gravel...Nobody else ever needs to know, and you can draw off any excess water from an over-enthusiastic watering with a turkey baster.

Unless you have the time to carry each pot to the sink for watering each week, and the patience to wait for them to finish dripping before hanging them back up, it is absolutely essential that your plant containers should have some method for catching water drips. Plastic hanging baskets almost always come with detachable saucers. Unfortunately these saucers are usually quite shallow and unless you water with a very light hand, you will get an overflow onto your floor. Got an old umbrella?...hang it upside down on the rim of your pot. It will catch all the drips while you carry on with the rest of your household chores.

>>>>>>>>>>>> Insects & Diseases <<<<<<<<<<<<

>>>>>>>>>>>> Diseases <<<<<<<<<<<<

Hoyas in general are subject to few diseases. Well grown plants, given the proper environment, are for the most part disease free. Under stress such as extremely moist (high humidity) conditions for extended periods of time, Hoyas are subject to fungus diseases. The fungus phomomis attacks Hoyas as well as the fungus anthracnosis, though the occurrences are so rare and isolated as to be insignificant. Seedling plants are subject to the damp-off organisms which girdle the tender shoot at the soil line. This can be prevented or controlled with the use of a systemic fungicide like Benomyl or copper based fungicides used according to directions.

It is a known fact that when large populations of one plant are grown in close proximity, it is more likely that an opportunistic pest will attack. So far we have not seen many common plant diseases in Hoyas, probably because of the limited number of very large Hoya collections. It is assumed that eventually we will face the invasion of plant viruses. Cultural methods can help protect us from this blind side attack. Always use sterile potting material, and be sure pots are new or scrubbed thoroughly and rinsed in a 10% solution of Clorox if old pots are to be reused. Rinse thoroughly in clear water to remove any chlorine left behind. Although many people prefer the old fashioned clay pot, the newer plastics are ideal, in that the smooth non-porous surfaces lend themselves so well to sterilization and re-use. As Clorox tends to rust steel, pruning and cutting instruments should be dipped into a Lysol solution between each cut to prevent spreading a viral infection from one plant to another. Most of us will not go to such trouble but if you suspect a virus, the above precautions will become a necessity. As with Orchids, a virus infected plant is best destroyed. Even a suspicious plant should be isolated. Viruses usually indicate their presence as a yellowish mottling of an otherwise green leaf, or a fading of the green along the veins. Zinc and iron deficiency may also cause this latter pattern in leaves.

>>>>>>>>>>>> Insects <<<<<<<<<<<<

Insects are the greater problem with Hoyas. Aphids are usually the most prevalent pest, and several species of aphid are fond of Hoyas. Different areas will have different aphids to contend with. The green peach aphid, oat bird cherry aphid and the yellow oleander aphid are a few of the more common types. You can find aphids of one kind or another, on just about every plant in your yard. You will also find them in your greenhouse if they have an easy way in. This can be by intake fans that pull

them in from outside, they can be brought in on your clothes, or they can get in through the tiniest crack in a screened in window. Aphids, as well as some species of mealybug and scale share a rather sophisticated technique of giving birth to live young females during the summer months. These females are born pregnant and begin to produce live young females of their own within a matter of 24 hours after birth. At this point...no males are needed, so none are born. By late fall, there will be males as well as females being born. The males always have wings but only some of the females do. Sexual mating takes place...the males die, and the winged females usually take off to find greener pastures elsewhere. The unwinged females remain behind and reproduce by laying eggs that overwinter in the rafters of your greenhouse, in material in your propagating bench, and possibly even in your pots. These eggs hatch out in the spring, all females, already pregnant and ready to produce offspring by the millions. Although the most persistent pest, they are also the easiest to kill. Aphids prefer the new growth, stem terminals and the underside of tender new foliage. Crush them by hand, or dab them with an alcohol soaked cotton swab. Diluted alcohol in a spray bottle will cover more area if you have a lot of affected plants. If the situation gets out of hand, you may have to resort to an insecticide such as Malathion or Cygon used according to directions. A second or even third application may be necessary.

In many areas of the world it is the mealybug that growers will encounter most often, and always seem to be present to some extent. Mealybugs look like small white wooly globs of cotton. They seem to prefer the pubescent plant types, but are by no means limited to these Hoyas. Favored places for mealy bugs to congregate and lay their eggs are in protected areas such as in leaf axils, and where stems cross or twine together. In the case of the indian rope Hoya they nest deep within the twisted leaves and are almost impossible to eradicate. The young are so small they can easily be overlooked. Treatment for this pest is the same as for aphids. Be ever watchful for their presence, and keep after them or they will get ahead of you.

Although we don't see them quite as often as mealybug, scale is another frequent visitor to our Hoyas. Usually tan to dark brown in color and dome shaped, these insects look more like a blister than an insect. A few days after hatching, or in many cases, live birth, they attach themselves to the stems or leaves of plants, lose their eyes and legs, and remain in one spot their entire life. Even on close inspection they look as if they were part of the plant itself. Scale is extremely hard to control if it gets a foothold on your plants. Mainly because the babies, or crawlers as they are called, will run underneath the Mother who has a hollowed out depression on the underside of her abdomen at the first sign of danger. Even if the Mother dies these babies are well protected, as are any eggs that have not as yet hatched. This is a situation that definitely needs the use of an insecticide.

>>>>>>>>>>>> Outdoors <<<<<<<<<<<<

It is a futile exercise to try to control insects and pests inside a greenhouse without giving attention to what surrounds it. It is usually these outdoor areas that harbor the initial pests that infest our plants. Lots of weeds close to the greenhouse could mean scores of grasshoppers and crickets mowing down your plants. Clean out the weeds and either haul them away or burn them. Berry vines and Ivy make a beautiful setting for a greenhouse; they are also famous hangouts for snails and slugs. I've never known of a slug that wouldn't leave a bed of Ivy to spend a week or two in a nice, moist greenhouse full of Hoyas. The destruction they can wreak in one night is frightful. Clear back all vines to six feet or more from your greenhouse. Use metaldahide based baits and liquids, and use them often to keep the population of these ugly beasts to a minimum. If you find a newly chewed leaf, examine the plant the following evening just after dark. Insects, snails and slugs included, have a biological affinity or preference for the nutrients from the same plant or species once they have fed on it, and will stick to the same food source before moving on.

Other pests you may encounter are rodents, usually mice or rats that will occasionally find their way to our Hoyas. A rat can mow down plants with a lust. Any large animal, including dogs and cats, can wreak havoc to precious plants. Act accordingly! Screen off all vents, coolers and other openings so animals do not become entangled or endangered.

It is possible that other insects and diseases may occasionally become a nuisance. In extremely dry conditions (low humidity), red spider mites and thrips can be a real problem. Spider mites especially, because they do not respond to the usual pesticides, and need a specific miticide to eradicate them. The chewing mouthparts of spider mites leave a silvering or silver speckles and a very sick look to all plants infested with them. If you are unfamiliar with the symptoms affecting your plants, or need help with finding a particular control method, contact a professional. Most sales people at your local garden center have been hired for the summer and usually don't know anymore about the subject than you do. Your best source of information would be the agent for the Department of Agriculture of whatever country you happen to live in. As an alternative, almost every library in the world has illustrated books that can help you to pin down what your problem is.

Once you start a control program, make sure you continue long enough to completely solve the problem. It does no good to spray or dip your plants once and then stop the treatment. There is bound to be bugs that you miss, as well as eggs that continue to hatch out to start the next generation. A word of WARNING: Be

extremely cautious with any insect spray. These are poisonous! If at all possible, move your plants outdoors, wear protective clothing and gloves... and always use insecticides at the recommended rates and dilutions as stated on the label.

Chapter 6

>>>>>>>>>>>> Plant Names <<<<<<<<<<<<

All plants came into the world without names. In an attempt to communicate and to distinguish one plant from another, man has given each individual plant a name. In the beginning, these names were in the local languages, and were mostly descriptive. Buttercup for instance or Skullcap. Many were descriptive of a use, such as Post Oak. These common names can be misleading, especially to a visitor from another area with a different language. Even among the English speaking countries of the world the term "Post Oak" was used (still is) for many different Oak species. As long as an oak was fairly straight it was considered suitable for posts and thus called a "Post Oak". In the Philippines, our common Portulaca is called Vietnam Rose. Now that's downright confusing!. The usefulness of a "common" name is most useful only in a local context.

These common names applied to plants can be used in our day to day communication with others in our own region, and for the most part cause no great problem. There are no rules or authority to render judgement on our use of them. We are free to call any blue flower that hangs like a bell a Bluebell. Once we move out of our immediate locality or region this system becomes very confusing. The people 30 miles to the West may call the lupine a Bluebell, which also has tiny, blue, bell shaped flowers.

Considering the vast number of different plants known in the world, estimated at over 300,000, with more being discovered and described daily, it is no wonder that a way had to be found so people around the world could generally agree with the principle by which a name choice was made. Some universal structure or set of rules that all would be willing to follow. This search resulted in "scientific" names controlled by the International Code of Botanical Nomenclature.

What is the difference between a common name and a scientific name? What makes one internationally accepted and the other not? According to international agreement, all scientific names are to be written and presented in Latin. Why Latin, a dead language seldom used anymore? Since Latin is no longer the official language of any country, its very use can cross all international boundaries without any nationalistic discontent. Latin was and still is the perfect apolitical language. Individual Latin words however have evolved to find their way into nearly every western language to a great degree, and in forms most of us do not even recognize.

By trial and error and over much time it was realized by learned men that the most workable naming system would be by utilizing two and only two parts for the naming of any plant. The first a generic name, the plant "Genus". The second a specific name which would be applied to an individual kind of plant, the plants "Species" name. When the medical doctor Carl Linne (Linnaeus) formerly applied this "Binomial System" in his book "Species Plantarum" in 1753, the system was confirmed. The International Code of Botanical Nomenclature thus dates from 1 May 1753 and is recognized as the official beginning for "Scientific" plant names. The value of these "Scientific" names lies in the universal acceptance of this "code". The code standardizes the use of the binomial system of nomenclature in Latin as the official, non political, non sectarian language in standard Roman alphabetical letters. Man being what he is, must still use his own judgement in deciding the correctness of names and their application. The correctness of which name goes with which particular plant still requires human judgement. The Code is merely the framework for these judgments. The International Code is still being fine tuned as a set of articles and explanations by which plants are to be named. The latest publication is dated 1988 and was adopted by the 14th International Botanical Congress held in Berlin Germany in July-August 1987.

Chapter 7

What Hoya Species Are Found Where

Let's start in the West and work our way East and south and look at the hoyas named and described from each location. Keep in mind that the taxonomy of species is always in flux. This is especially true of our genus, since it is only recently that a concentrated effort has been made to systematically study these plants. Many names may be found that are synonymous, many will be lumped together by taxonomists who interpret species in a broad sense. New species will be discovered as more intensive collecting continues and lastly...some will become extinct in the future. I have designated the country, the species name, followed by the author and the date published. A few of the species listed are no longer considered to be in the Hoya genus.

Sri Lanka (Ceylon)

alexicaca Moon	1824
hirsuta Moon	1824
lacuna Wight	1834
ovalifolia Wight	1834
reticulata Moon	1894
veridiflora Brown	1909
wightiana Thwaites	1864

India & Burma

acuminata Bentham ex Hooker f.	1883
acuta Haworth	1821
aldrichii Hemsley	1890
angustifolia Lindley	
arnottiana Wight	1834
bella Hooker	1848
bhutanica Gierson & Long	1979
brunoniana Wight	1834
burmanica Rolfe	1920
collettii Schlechter	1913
crassifolia Haworth	1837
edenii King ex Hooker	1883
esculenta Tsiang	1936
fusca Wallich	1831
globulosa Hooker	1882
gonoloboides Regel	1883
griffithii Hooker f.	1883
griffithiana Decaisne	1883
gymnanthera Wight	1834
hookeriana Wight	1834
iconum Santapua	1956
kanyakumariana Henry & Swam.	1978
lanceolata Wallich ex D. Don	1825
linearis Wallich	1834
lobbii Hooker f.	1883
lacuna Wight	1837
longifolia Wallich	1834

manipurensis Deb	1955
micrantha Hooker f.	1883
nummmularia Decne. ex Hooker	1883
obcordata Hooker f.	1883
obreniformis King	1910
oblanceolata Hooker f.	1883
ovalifolia Wight & Arnott	1834
pallida Dalz & Gibs	1861
pallida Lindley	1826
parasitica Wallich	1830
parasitica(acuta) Haworth	1821
parviflora Wight	1834
pauciflora Wight	1848
pendula Wight & Arn	1834
planiflora Wallich ex Hooker f.	1861
polyneura Hooker f.	1883
retusa Dalz	1883
serpens Hooker f.	1883
shephardii Short ex Hooker	1861
suaveolens (Hort)	1856
teretifolia Griffith ex Hooker	1883
thompsonii Hooker f.	1883
vaccinioides Hooker	1853
verticillata G. Don	1837
viridifolia R. Brown	1809
viridifolia Griffith	1835
volubilis Griffith	1835
wallichiana Decaisne	1844
wightii Hooker f.	1883

acuta Haworth	1821
blumeana Schlechter	1913
brooksii Ridley	1925
campanulata Blume	1826
caudata Hooker f.	1883
citrina Ridley	1922
coriacea Blume	1850
coronaria Blume	1825
crassifolia Ridley	1912
curtisii King & Gamble	1913
cystiantha Schlechter	1913
diversifolia Blume	1826
endauensis Kiew	1988
elliptica Hooker f.	1883
engleriana Hosseus	1904
esculenta Tsiang	1936
erythrina Rintz	1978
erythrostemma Kerr	1939
excavata Teijsmann & Binn.	1863
finlaysonii Wight	1834
flagellata Kerr	1940
forbesii King & Gamble	1906
globiflora Ridley	1915
graveolens Kerr	1939
imperialis Lindley	1846
kerrii Craib	1911
lacunosa Blume	1826

lanceolata Lindley	1826
lasiantha Korthals ex Blume	1848
latifolia G. Don	1838
macrophylla Blume	1826
macrophylla Wight	1840
micrantha Hooker f.	1883
maingayi Hooker	1883
mitrata Kerr	1940
multiflora Blume	1823
obtusifolia Wight	1834
occlusa Ridley	1912
oreogena Kerr	1939
ovalifolia Wallich	
parasitica Wallich	1830
pachyclada Kerr	1939
padangensis Schlechter	1916
parviflora Wight	1834
parvifolia Schlechter	1908
perakensis Ridley	1910
plicata King & Gamble	1908
praetorii Miquel	1856
purpurascens Teijsmann & Binn.	1863
pusilla Rintz	1978
reticulata Moon	1824
revoluta Wight	1883
ridleyi King & Gamble	1908
rhodostele Ridley	1923
rufolanata Ridley	1923
sarcophylla Ridley	1917

scortechinii King & Gamble	1908
siamica Craib	1911
speciosa Decaisne	1844
splendens Maingay	1837
subquintuplinervis Miquel	1869
sussuela (Roxb.) Merrill	1917
teysmanniana Miquel	1856
treubiana Schlechter	1908
uncinata Teijsmann	1863
variifolia Ridley	1926
wrayi King & Gamble	1908

Amboina, Timor, Nicobar

alba Kostel.	1834
amboinensis Warburg	1907
ariadna Decaisne	1844
corona ariadnes Blume	1863
laurifolia Decaisne	1834
lutea Decaisne	1844
lutea Kostel.	1834
nicobarica R. Brown	1830
speciosa Decaisne	1844
splendens Maingay	1837
subquintuplinervis Miquel	1869
sussuela (Roxb.)Merrill	1917
rumphii Blume	1828

China, Taiwan, Hainnan, Okinawa, Japan

angustifolia Traill	1830
carnosa R.Brown	1810
cavalerieri Leveille	1914
chinensis Traill	1830
cordata Li & Huang	1985
dasyantha Tsiang	1936
esquirolii Leveille	1912
formosana Yamazaki	1968
fungi Merrill	1934
hainanensis Merrill	1923
kwangsiensis Tsiang & Li	1974
lancilimba Merrill	1932
lantsangensis Tsiang	1974
lasiogynostegia Li	1984
liangii Tsiang	1936
lipoensis Li & Xu	1985
lyi Leveille	1907
mengtzeensis Tsiang & Li	1974
motoskei Teijsmann & Binnend.	1852
multiflora Blume	1823
nervosa Tsiang & Li	1974
obscurinervia Merrill	1923
pallida Lindley	1844
pandurata Tsiang	1939
picta Siebold	1853
pottsii Traill	1830
radicalis Tsiang & Li	1974

revolubilis Tsiang	1974
rotundifolia Siebold	1841
salweenica Tsiang & Li	1974
silvatica Tsiang & Li	1974
tsoi merrill	1934
tsiangiana Li	1984
trinervis Traill	1824
variegata Siebold ex Morren	1846
variegata De Vriese	1846
yuennanensis Hand-Mass.	1936

Laos, Vietnam,Siam,Cambodia

balansae Costantin	1912
bonii Costantin	1912
cochinchinensis Roem. & Schltz.	1817
costantinii Li	1984
diversifolia Blume	1826
engleriana Hosseus	1907
erythrostemma Kerr	1939
flagelata Kerr	1940
globosa Lecomte	1912
graveolens Kerr	1939
kerrii Craib	1911
membranifolia Costantin	1912
minima Costantin	1912
mitrata Kerr	1940
nummularioides Costantin	1912
obcordata Teijsmann & Binn.	1866
oblongacutifolia Costantin	1912

oreogena Kerr	1939
pachyclada Kerr	1939
parasitica Wallich	1830
pseudolanceolata Costantin	1912
pseudovarifolia Costantin	1912
pubens Costantin	1912
reticulata Costantin	1912
rigida Kerr	1939
siamica Craib	1911
subquintuplinervis Miquel	1856
vilosa Costantin	1912

Philippines

alagensis Kloppenburg	1990
angustifolia Elmer	1938
angustisepala Burton	1987
benguetensis Schlechter	1906
bilobata Schlechter	1906
bordenii Schlechter	1904
bulusanensis Elmer	1938
burtoniae Kloppenburg	1990
camphorifolia Warburg	1904
cagayanensis Burton	1987
cardiophylla Merrill	1920
cembra Kloppenburg	1990
ciliata Elmer	1938
ciliata ex Burton	1988
crassicaulis Elmer	1938
cumingiana Decaisne	1844

darwinii Loher	1910
edanoi Burton	1991
el-nidicus Kloppenburg	1991
fischeriana Warburg	1904
golamcoiana Kloppenburg	1991
gracilis Schlechter	1908
halconensis Kloppenburg	1990
heuschkeliana Kloppenburg	1989
imbricata Decaisne	1844
incrassata Warburg	1904
kentiana Burton	1991
leytensis Elmer	1938
leytensis Elmer ex Burton	1991
lindleyana F. Vill.	1880
loherii Kloppenburg	1991
longipes Schlechter ex Elmer	1938
luzonica Schlechter	1904
madulidii Kloppenburg	1990
mcgregorii Schlechter	1906
meliflua Blanco ex Merrill	1837
merrillii Schlechter	1904
mindanensis Elmer	1938
mindorensis Schlechter	1906
multiflora Blume	1823
obscura Elmer	1938
obscura Elmer ex Merrill ex Burton	1986
odorata Schlechter	1906
orientalis Li	1984
palawanica Kloppenburg	1990

panchoi Kloppenburg	1991
paziae Kloppenburg	1990
pentaphlebia Merrill	1918
philippinensis Li	1984
pseudomaxima Koorders	1919
pubicalyx Merrill	1918
pubifera Elmer	1938
pulgarensis Elmer	1938
quinquinervia Warburg	1904
reflexa Benth & Hooker f.	1880
reticulata Merrill	1920
rizaliana Kloppenburg	1991
rotundisepala Elmer	1938
ruscifolia Decaisne	1844
schallertiae Burton	1987
tsangii Burton	1991

Borneo

aeschynanthoides Schlechter	1908
ariadna Decaisne	1844
corona ariadnes Blume	1863
diversifolia Blume	1826
elmerii Merrill	1929
glabra Schlechter	1908
imperialis Lindley	1846
lasiantha Korthals ex Blume	1846
meredithii Green	1989
multiflora Blume	1823
phylura Schwartz	1931

sussuela (Roxb.) Merrill	1917
vacciniiflora Schwartz	1931

Java

alba Kosteletsky	1917
albiflora Zipp. ex Blume	1848
amoena Brink	1950
browniana Koorders	1911
cinnamomifolia Hooker	1848
clandestina Blume	1848
coccinea Hort. ex Lem.	1848
coriacea Blume	1826
coriacea Zollinger & Miquell	1856
densifolia Turcz.	1848
diversifolia Blume	1826
elegans Kosteletsky	1834
fraterna Blume	1849
grandiflora Blume ex Decaisne	1844
hasseltii Miquel	1856
icrassipes Turcz.	1848
javanica Boerl.	1899
kuhlii Koorders	1912
lacunosa Blume	1826
lasiantha Korthals ex Blume	1856
laurifolia Decaisne	1838
laurifolia Miquell	1863
laurifoliopsis Hochtreutner	1936
leembruggeniana Koorders	1911
lindaueana Koorders	1911

longifolia Miquel	1856
macrophylla Blume	1848
magniflora Li	1984
multiflora Blume	1826
opposita G. Don	1837
orbiculata Wallich	1834
ottolanderi Koorders	1911
picta Miquel	1856
polystachya Blume	1849
pubera Blume	1826
purpureofusca Hooker	1849
recurvifolia Zipp. ex Blume	1849
rumphii Blume	1826
subquaterna Miquel	1856
tenggerensis Brink f.	1950
tiapeansis Hocheutiner	1938
treubiana Schlechter	1908
tjadasmalangensis Brink f.	1950
tjampeaensis Hocheutiner	1936
uncinata Teijsmann & Binn.	1863
velutina Wight	1834
vitellina Blume	1849
vitellinoides Brink f.	1950
zollingeriana Miquel	1856

Celebes, Malacca (Moluccas)

ariadna Decaisne	1844
bandaensis Schltr.	1908
buruenensis Miquel	1869

caudata Hooker f.	1883
celebica Handl.	1856
ciliata Teijsmann & Binn.	1866
corona ariadnes Blume	1863
rumphii Blume	1826
celebica Handl.	1856
collyrioides Teijsmann & Binn.	1866
diversifolia Blume	1826
dolichosparte Schlechter	1916
elliptica Hooker f.	1883
excavata Teijsmann & Binn.	1862
gracilis Schlechter	1908
imperialis Lindley	1846
incurvula Schlechter	1916
maingayi Hooker f.	1883
maxima Teijsmann	1863
maxima (Karst) Warburg	1907
minahassae Schlechter	1916
multiflora Blume	1823
obovata Decaisne	1844
opposita G. Don.	1837
parasitica Wallich	1830
retusa Warburg	1907
rumphii Blume	1826
splendens Maingay	1837
sussuela (Rox) Merrill	1917
tsiangiana Li	1984
velutina Griffith	1854

New Guinea

albiflora Zipp. ex Blume	1852
anulata Schlechter	1905
apiculata Scheff.	1876
apoda S. Moore	1916
archboldiana C. Norman	1937
billardieri Decaisne	1844
calycina Schlechter	1913
chloroleuca Schlechter	1913
chunii Li	1984
collina Schlechter	1913
coronaria var. papuana	1898
dictyoneura Schumann	1905
dimorpha Bailey	1898
dischorensis Schlechter	1913
eitapensis Schlechter	1913
epedunculata Schlechter	1913
exilis Schlechter	1913
flavescens Schlechter	1913
gigas Schlechter	1913
globulifera Blume	1849
gracilipes Schlechter	1905
halophila Schlechter	1913
hellwigiana (hellwigii) Warburg	1907
hollrungii Warburg	1907
hypolasia Schlechter	1913
ischnopus Schlechter	1913
kenejiana Schlechter	1913

klossii S. Moore	1916
lactea S. Moore	1914
lamchytonianae Schumann	1898
lamingtoniae Bailey	1898
lanceolaria S. Moore	1916
lauterbachii Schumann	1896
leucantha S. Moore	1916
leucorhoda Schlechter	1913
littoralis Schlechter	1905
marginata Schlechter	1905
megalaster Warburg	1907
microphylla Schlechter	1913
microstemma Schlechter	1913
montana Schlechter	1913
mucronulata Warb	1907
neoguineensis Engler	1886
oleoides Schlechter	1913
oligantha Schlechter	1913
oreostemma Schlechter	1913
oxycoccoides S. Moore	1916
pachyphylla Schumann & Lauter.	1901
pachypus S. Moore	1914
papillantha Schumann	1898
papuana Schlechter	1913
patella Schlechter	1913
pedunculata Schlechter	1913
peekelii Markgraf	1927
piestolepis Schlechter	1913
poolei White & Francis	1927

pruinosa Miquel	1856
pseudolittoralis Norman	1937
pulchella Schlechter	1913
purpurea Blume	1848
pusilliflora S. Moore	1916
reticulata Schlechter ex Engler	1913
rhodostemma Schlechter	1913
rosea Schumann	1905
rubida Schlechter	1905
schlechteriana S. Moore	1916
sogeriensis S. Moore	1913
solaniflora Schlechter	1913
sororia Schumann	1905
stenophylla Schlechter	1913
subcalva Burkill	1901
subglabra Schlechter	1913
torricellensis Schlechter	1913
trigonolobus Schlechter	1905
venusta Schlechter	1913
wariana Schlechter	1913

Australia

alata Hill	1988
aldrichii Hemsley	1890
australis R. Brown ex Trail	1830
barbata Spreng	1825
barracki Horne ex Backer	1883
flexuosa Spreng.	1820
grandiflora Spreng.	1820

keysii Bailey	1884
lauterbachii Schumann	1896
littoralis Schlechter	1905
macgillivrayi Bailey	1914
nicholsoniae Muller	1866
oligotricha Hill	1986
paniculata Spreng.	1820
poolei White & Francis	1927
pseudolitoralis Norman	1937
rupicola Hill	1988
sanae Bailey	1897

Ponapae

schneei Schlechter	1921

Truck

trukensis Hosokawa	1937

Solomon Islands

affinis Hemsley	1892
australis (island type)	1830
bicarinata A. Gray	1862
cominsii Hemsley	1890
dodecatheiflora Fosburg	1940
guppyi Oliver	1892
inconspicua Hemsley	1894
marginata Schlechter	1907
naumanii Schlechter	1908

Vanuatu (New Hebrides)

australis (island type)	1830
bicarinata A. Gray	1862
neoebudica Guillaumin	1937

New Caledonia

limoniaca S. Moore	1921
neocaledonica Schlechter	1906

Fiji

barracki Horne ex Baker	1862
bicarinata A. Gray	1862
diptera Seemann	1861
intermedia A.C. Smith	1942
megalantha Turrill	1915
pilosa Seemann	1861
vitiensis Turrill	1915

Samoa

attenuata Christophersen	1935
australis (island type)	1830
betchei Schlechter	1913
bicarinata A. Gray	1862
chlorantha Reichinger	1908
crassior Hochtreutuner	1936
filiformis Reichinger	1908
pubescens Reinecke	1893
pycnophylla Reichinger	1908

samoensis Seemann	1866
upoluensis Reinecke	1893

Tonga

bicarinata A. Gray	1861

Miscellaneous Names

africana Decaisne	1844
albens Miller ex Steud	1826
coriacea Zollinger & Miquel 1856	
crocea Tuinbouw 1853	
dalrympliana F. Mull.	
esculenta Tsiang	1936
fuscomarginata N.E. Brown	1910
gonoloboides Regel (India ?)	1844
paxtonii Nichols	1852
picta (Hort)	1853
recurvifolia Zipp. ex Blume	
sikkimensis (Hort.)	
suaveolens (Hort.)	
trinervia (Hort.) Mach. ex Regal	1884
variegata De Vriese	

Now that you have seen the list of species, keep in mind that we are still learning about hoyas, hoya habitats, and hoya species. Many on this list may be synonymous with others. Many may have extended ranges or may be indigenous to an area and not listed. Last there are undoubtedly species yet to be found and described and some are likely to be extinct, or on the verge of extinction. At present we have not collected H. trukensis from the island complex of Truk in the Central Pacific Islands South/ South East of Guam. It is possibly extinct. A hoya or closely related species, H. rufolanata, a herbarium sheet of which exists in the Bogor herbarium in Java has not been recollected. The stream and bordering jungle areas of the Sungai Sipur (River), in central West Malaya, Perak area, where this species was originally collected has been dredged for the recovery of Tin. All vegetation has been destroyed and all that remains are the continuous mounds of white sediment, it is unlikely that the species survived. It is as if a huge gopher had tunneled up the Sungai river.

Chapter 8

>>>>>>>>>>>> Questions About Hoyas <<<<<<<<<<<<

What was the first Hoya ever collected, and in what year?

The year collected is not certain, but Hoya carnosa R. Brown was first published under the name Asclepias carnosa Linn. f. in 1781. Robert Brown renamed this plant Hoya carnosa in honor of Thomas Hoy, thereby establishing a new genus, and published it as Hoya carnosa R. Brown in 1810. There is strong evidence that the species we know as H. motoskei was that original plant.

What do the names following the species name mean, such as H. angustifolia Elmer?

The name following the species name is the last name of the person publishing that particular species, and becomes part of the species name. It is also a method for keeping this plant apart from others with the same name such as H. angustifolia Trail which is a totally different species. It would be good to add at this point; that the first publishing of a species name...along with the name of the author is the only plant allowed to carry this name, and any subsequent duplications of that particular species name must have another name selected.

Who are some of the botanists or collectors that published all of these Hoyas?

It's impossible to name them all, but some of the familiar names connected with Hoyas listed here by date of birth, and date of death when known are:

Bentham, George	(1800-1884)
Binnendijk, Simon	(1821-1883)
Blanco, Francisco Manuel	(1788-1845)
Blume, Carl Ludwig, Von	(1796-1862)
Brown, Robert R.	(1773-1858)
Costantin, Julien Noél	(1857-1936)
Craib, William Grant	(1882-1933)
Decaisne, Joseph	(1807-1882)
DeVriese, Willem Hendrik	(1806-1862)
Don, David	(1799-1841)
Don, George	(1798-1856)

Elmer, Adolph Daniel Edward	(1870-1942)
Gamble, James Sykes	(1847-1925)
Haworth, Adrian Hardy	(1768-1833)
Hooker, Joseph Dalton	(1817-1911)
Hooker, William Jaekson	(1785-1865)
Hosseus, Carl Curt	(1878-1950)
Korthals, Pieter Willem	(1807-1892)
Kosteletzky, Vineent Franz	(1801-1887)
Léveillé, Augustin Abel Heetor	(1863-1918)
Lindley, John	(1799-1865)

Loher, August , no dates given other than that he was publishing species in the year 1910.

Merrill, Elmer Drew	(1876-1956)
Miquel, Friedrieh Anton Wilhelm	(1811-1871)
Moon, Alexander, no birthdate (died)	(1925)
Regel, Edward August	(1815-1892)
Ridley, Henry Nieholas	(1855-1956)
Roxburgh, William	(1751-1815)
Sehleehter, Friedrieh Riehard Rudolph	(1872-1925)
Siebold, Philipp Franz Von	(1796-1866)
Wallieh, Nathaniel also known as Nathan Wolff	(1786-1854)
Wight, Robert	(1796-1872)
Zippelius, Alexander	(1797-1828)
Zollinger, Heinrieh	(1818-1859)

Why don't my Hoyas bloom?

That question crops up in almost every conversation that has ever been held concerning Hoyas. You can hear every conceivable answer, most of them wrong. The truth is, that if a Hoya is mature but hasn't bloomed, it is usually because it isn't getting enough light.

How old do Hoyas have to be before they bloom?

There are too many Hoya species involved to give a pat answer to that question. Many Hoyas will bloom in their first year of growth, some will take two years, others may need three or more years before they are mature enough to bloom. If conditions aren't right...mature or not, they may never bloom until those conditions are corrected.

What can I do to correct my growing methods in order to get flowers?

For the majority of Hoyas, the magic wand that brings on flowers is extremely bright but indirect light...no direct sun. If possible the humidity of your growing area should be kept above 40 percent, 60 percent would be even better but hard to maintain in a home. Keep a spray bottle handy and mist your plants often. Another hint that may help to bring on blooms is to give them a real jolt with a feeding or two of a high phosphorous fertilizer. These fertilizers are usually labeled as Bloom Boosters.

Which Hoyas will bloom better in the shade?

Many Hoyas will "grow" in the shade...most will never bloom under those conditions. Hoya lacunosa seems to prefer filtered light for blooms, but certainly not deep shade on a year round basis.

Do Hoyas bloom just in the summer?

Some Hoyas bloom in the spring and summer, others bloom off and on all year

long. There are a few Hoya species that bloom only in late fall or winter.

Is there a "Magic" formula potting mix that is better than any other for Hoyas?

Hoyas have a real advantage in that they adapt so readily to many different potting mediums that other plants would find unacceptable. Most of the pre-packaged all purpose houseplant mixes work great right out of the sack, or you may have to lighten some of them with added perlite (sponge rock). The main thing is to insure fast drainage so they don't remain wet and soggy. They must also be light enough so they don't become hard and compacted. Many Hoya growers use a half and half mix of sphagnum peat moss and perlite with some added dolomite lime, or a calcium source to neutralize the acid in the peat moss. Watch your plants! They will usually let you know if they are unhappy.

Why is it that some cuttings will root but then just sit and do nothing, while cuttings from the same plant, planted at the same time and under the same conditions will grow vigorously?

That is a mystery! Growth hormones within the cuttings, or lack of them is probably the cause. If you have cuttings growing of the same plant, why not just dump those that don't grow. If it's an expensive cutting or one of a kind, and you have the patience to wait it out, they will eventually put out new growth.

What is the best way to train a straggly looking Hoya to a nice compact shape?

Wire or plastic hoops with built in pot holders can be purchased, as well as wire, cedar, redwood and wicker trellises. These make beautiful displays when Hoyas are allowed to twine around the hoops or wind in and out of the trellises. The major disadvantage to these devices, is in trying to repot a plant that has spent several years entangling themselves in one of them. There is no way you can skillfully remove a plant in one piece.

Actually the best way to contain a climbing, twining plant is to wrap the branches around the plant itself as it grows. Drastic pruning may be called for occasionally if the plant grows completely out of bounds.

Are clay pots better for planting Hoyas in than plastic pots?

Whether a Hoya is planted in clay or plastic is a matter of personal preference. They all have their own advantages and disadvantages. Plastic has been the preferred container for all types of plants in the past twenty years. The benefits to plastic are that they are light weight, relatively inexpensive, easy to clean for re-use and they hold moisture longer than clay, which is a real advantage if the new soilless mixes are used. There are, however, some growers who won't plant in anything but clay. Clay has the advantage of being heavy enough to hold large growing plants without tipping over. They dry out fairly fast which is important if heavy, soil based mixes are used. Unlike plastic, they are porous so plant roots stay cooler in summer.

What color are Hoya flowers?

Every color has been verified in Hoya flowers except blue and black. H. ciliata that is called the "black Hoya", is actually an extremely dark purple. A few years ago, an amateur collector claimed to have found a "true blue" Hoya...this Hoya turned out to be "mauve" which is a light pinkish purple.

Some of my Hoyas have beautiful glossy foliage while others have a dull, dusty appearance. Why is this?

Trying to diagnose what ails a plant without seeing the plant and the conditions under which it is grown is impossible. Any number of things can cause a plant to look dull and dusty, including which species it is. Some Hoya species don't have glossy foliage, but they look healthy. Make out a checklist and write down these questions: Have these

plants ever had glossy foliage? Have they ever been allowed to dry out to a point of wilting? Have they been kept so wet that the roots may have started rotting? Is your humidity extremely low? Are these plants sitting in a draft of cold air? Are they where hot air from a furnace fan can blow directly on them? Have they been examined for an insect infestation? Answer all of these questions, and you can probably come up with an answer. It is sufficient to say briefly that anything that affects a plant's root system will also affect the appearance of the foliage. Low humidity is a slow agonizing death for most tropical plants, and normally shows up first in the appearance of the foliage. Low humidity also favors a spider mite attack which can cause foliage to look dull and dusty.

What kind of plant food do Hoyas need for growth and bloom?

Let's rephrase that question to read...What chemical elements can we provide that will help our Hoyas (or any other plant) to make its own food?

Without getting too technical, it's only necessary to say that all "green growing things" manufacture their own food from sunlight and water. All we can do as their human overseers is to insure that they have access to the essential chemical elements that their natural habitats normally provide for them. The most important supplemental elements are nitrogen, phosphorus and potassium. These three elements are vital components of a healthy plant. Without all of them, in proper balance, a plant can't repair itself or build new cells. Under most circumstances, a balanced "plant food" such as a 20-20-20 formula is ideal.

What are the symptoms of a Hoya that is deficient in nitrogen?

The lower or older leaves will usually turn yellow or pale, sickly looking green, dry and drop off; some may become brownish/orange. The new growth will rob the older leaves of any chlorophyll that is retained, but there is not enough to support this new growth so it remains stunted, pale and often curled and distorted. The fastest remedy for a plant in this condition is a foliar feeding with 2 tablespoons of fish emulsion mixed in a gallon of very warm, but not hot water. Mist the entire plant very lightly with this solution. You want just a frost of mist on the leaves. Do this every 3 or 4 days for a couple of weeks. You will see a definite improvement in a very short time.

What is meant by the expression foliar feeding?

Foliar feeding is a method of getting nutrients into a plant through the foliage instead of the roots. In nature, epiphytes get a large portion of their nutrients through their leaves when rain and mist washes debris such as bird droppings, dead leaves etc. down from higher up in the tree tops. We try to duplicate nature by using devices that apply needed nutrients as a very fine mist.

Are there any Hoyas that have a natural immunity to pests such as mealybugs and aphids?

Nature has devised some clever ways for different plants to ward off attacks by insects, and also from larger animals. This is usually accomplished through chemical means (the plant sap is poisonous or contains a chemical that stings). Some plants have developed millions of tiny thorns, others have developed huge, wicked looking, and very dangerous barbs. Hoyas don't have any of these obvious weapons, unless it's chemical. There are some Hoyas that never seem to be bothered with mealybugs. H. micrantha is one that I don't recall ever seeing with mealybugs...or aphids. H. obscura and H. plicata are two that seldom have aphids, but will occasionally have a few mealybugs. This might be a concept that no one has ever thought to look into. Wouldn't it be great if we could make up a brew of stewed, immune Hoya leaves to spray on our other Hoyas!

What causes Hoya buds to dry up and drop off without opening, or fall off within a few hours after opening?

Usually Hoyas that dry up and drop their buds have been allowed to become too dry between waterings. Hoyas will also drop their buds if the potting mixture is constantly kept too wet. However they don't dry up in this case but become yellow and spongy, or brown and mushy. Your buds that open but fall off soon after, are probably placed where a cool draft is hitting them (maybe from a fan).

Can you tell me which Hoyas grow wild in Hawaii?

There are no Hoya species known to have evolved naturally in Hawaii. The Hoyas that grow there now, have been lovingly planted by the "wild" but human hands of a couple of Hoya collectors that live there.

What is the best way to remove hard water spots from Hoya leaves?

One teaspoon of vinegar (white or red) mixed in a pint of warm water will remove most water spots. Dip a soft cloth in this solution and rub each leaf gently in a circular motion, rinse with clear water and dry with another soft cloth. If you want a real shine to your leaves, try mixing one teaspoon of real mayonnaise (not salad dressing) with three tablespoons of warm water. Apply to your leaves with a cottonball or soft cloth, then wipe dry. This formula does not clog the pores of your leaves like commercial leaf shine products, and your leaves will absolutely glisten.

Will Hoyas grow from a single leaf?

There are those who say they will...and those who say they won't. If all you had was one leaf of the only plant of its kind left in the world, it would probably be at least worth the effort to "try" to get a plant to grow from that leaf.

Will Hoyas bloom under fluorescent light?

Absolutely! And some bloom better than others. Most of the little miniatures and semi-miniatures are even happier under artificial light than they are in natural light.

If I grow Hoyas in a light garden with fluorescent light, how many hours a day do I need to keep the lights on?

An absolute minimum for growth is 12 to 14 hours per day. If you're pushing for bloom, 14 to 16 hours is even better.

What size pot is best to plant Hoyas in?

That would depend entirely on how big the plant is that you're planning to pot. If you are planting rooted cuttings, a 4" pot is usually sufficient for up to a year, or longer if it's a small growing plant. Pot sizes for plants that are being potted up to a larger size, should be at least 1" but no larger than 2" larger than the root ball of your plant.

What's the story on pruning Hoyas...Should we or shouldn't we?

An "old wives tale" that makes the rounds quite often, says "you should never prune Hoyas or you will cut off the bloom spurs". That is partly true! You will cut off bloom spurs, however, the other part of the story is...If you prune a plant, you will force many new branches, and these new branches are usually loaded with new bloom spurs. Go ahead and prune your plants, and be prepared for a bushier, prettier plant with lots of flowers.

When is the best time of the year to repot Hoyas?

Just as a plant is getting ready to go into a period of active growth is the ideal time to repot. There may be times that for one reason or another you may have to consider repotting at some other time. This normally doesn't affect Hoyas one way or another They usually come through it with flying colors.

Is there any advantage to mixing "birth control pills" into potting mix?

Several years ago there was a flurry of excitement about the wonderful results that could be had by using birth control pills in all kinds of plants. After a short while, no more was heard about birth control pills for plants.

I have had a plant of H. serpens for several years. It struggles to stay alive and has never bloomed. Should I give up the idea of growing it?

Hoya serpens is a beautiful little miniature species, and if they are happy, they grow and bloom as well, if not better than many other Hoyas. Remember that H. serpens is a miniature creeper with very tiny roots. It doesn't like deep pots, or soil based mixes, so the preferred method for growing is in a shallow bed of sphagnum peat moss. This peat moss can be packed in a shallow tray, stapled to a piece of cork bark or a small log...any number of ways. Let your imagination run wild. You will probably have more success with this method by rooting some new cuttings in sphagnum peat or coarse vermiculite. You may use cuttings taken from your old plant, but don't use the plant itself. If the plant has been struggling for its very life as you said, there is probably very few roots left anyway. Take as many cuttings as you can, then throw the old plant away. The type of light these creepers receive on the forest floor is rather dim light that filters through the foliage of the taller underbrush. They probably spend several hours each day in dense shade, so they normally do better in cultivation than they do in the wild, because they receive more light. Give them lots of light in the winter, then move them to an area that gets very early morning sun with bright shade the rest of the day for the summer months.

Some books say to use phosphorus for flower production, others say potassium...which is correct?

Actually both of these elements help to promote buds and flower production, however all the fertilizer products on the market that claim to be "blossom boosters" have a higher middle number, which is always the phosphorus analysis.

A friend of mine says Hoyas are in the African Violet family, I say they are in the Orchid family. Who is right?

Sorry, neither one of you are! Hoyas are in the Asclepiadaceae or Milk Weed family, which contains among other genera Ceropegias, Stephanotis, Stapelia and the beautiful Asclepias which the tribe or plant family was named after.

Are there places where Hoyas can grow outside all year?

Certainly, they grow outside in their native habitat! I'm sure you must be referring to specific areas in the United States such as Florida, Southern California, Hawaii, etc. There are quite a few species that can grow outside all year long in some areas of Southern California and Florida, and even more species that can live outdoors in Hawaii. There are times that the temperature can and does drop to a dangerous level both in Florida and Southern California. If the temperature remains low for more than just a very short time...plants could be lost, then more cuttings would be purchased from those of us who grow our plants in nice warm green houses.

I've heard that I should give my Hoyas a bath. Is this really necessary?

There are many interpretations of what "a bath" means. There are those who have the idea that a plant needs to be lathered up with soap suds, rinsed and dried before they consider a plant to be clean. Although this would certainly help to kill insects, wash away insect eggs and remove the sticky honeydew that accumulates on the leaves from aphids, mealybugs and scale...it's not the only way to bathe a plant. A forceful spray with plain warm water from a hose can be almost as effective. If you live in an apartment where you wouldn't have access to an area suitable for using a hose, a bathtub is a perfect place for a bath or shower for your plants. Is a bath really necessary?...your plants probably won't

die without one, but they are much happier if they can have an occasional bath.

I have an H. nicholsoniae whose leaves have turned a dark brownish red. Could this be from a phosphorus deficiency?

I doubt it! Many of the H. nicholsoniae type plants as well as some other species in the Hoya genus have leaves that turn glossy brownish red or mahogany colored in bright light. The color changes that are caused by nutrient deficiencies are dull, lifeless looking colors. They usually start with the older leaves and slowly progress through the entire plant. The plant has an overall stunted appearance, and looks very unwell.

I have ten large Hoya plants that have been in 8" baskets for over four years. I have never used fertilizers on them because I don't want them to get any bigger. They don't look very healthy anymore, and a friend says they are suffering from a lack of nutrients. What does that mean, and what are the symptoms of lack of nutrients?

Your friend is probably right! After four years in a pot, most potting mixes would be pretty well depleted of any nutrients that they originally contained. The chemical element that is depleted the fastest in any gardening...indoors or out, is nitrogen. The older leaves turn yellow, or a very sick looking pale, grayish green, and usually drop off in huge numbers. Any new growth is pale, stunted and often curled and distorted. A phosphorus deficiency shows up first in the leaf edges, tips and veins of a plant. These areas turn dull red or bronze beginning with the older leaves first. Any new growth is stunted, or stopped entirely. The leaves will eventually turn a garish blue green, then dull purple mottled with brown and yellow. With a potassium deficiency the leaf tips and edges turn tan, bronze or sometimes even dull red, followed by crinkled, burned leaf edges. The leaf blades will turn yellow, beginning with the older leaves. New growth is stunted with shorter than normal distances between the leaves. These are the three main chemical elements that your plants need to help them manufacture their own food. When plants are severely deficient in these three components it is safe to assume that all the other needed chemical elements are deficient also. If you have any halfway healthy looking growth still on these plants, I would recommend that you take some cuttings from the healthy parts and start some new plants. Then start a regular feeding program for your old plants, using a balanced fertilizer such as Peters 20-20-20 formula, or any other good brand that has all the required trace elements included in its ingredients.

What is meant by the expression "sexual reproduction" in plants?

That phrase refers to the reproduction of plants by the same method of reproduction that occurs in animal life...Pollen from the male sex organ (the stamen) is transferred to the female sex organ (the pistil) so that fertilization occurs, leading to the production of seeds or spores.

What is meant by the expression "asexual reproduction" in plants?

The term asexual reproduction refers to the vegetative method of multiplying plants using parts of the same plant, such as by stem or leaf cuttings, or by planting bulblets, rhizomes, or by dividing the plant itself.

The botanical names on some of these plants are real tongue twisters. Is there a sensible reason behind some of these names?

Many botanical names are descriptive of a prominent part of a plant. Sometimes it's the foliage e.g. Hoya carnosa, which means fleshy or of fleshy consistency. Other names will refer to a description of the flower e.g. Hoya pauciflora (few flowered), the flower parts e.g. Hoya pubicalyx (pubescent or fuzzy calyx), or maybe even a flower color e.g. Hoya purpureofusca (reddish brown flower). These descriptive names are often very helpful to taxonomists in identifying a plant. Much more so than naming them after a

person or place. The names really aren't that difficult if they are broken into syllables and pronounced slowly.

What are the tiny little black flies that fly around potted plants?

These are probably fungus gnats. They lay eggs in the potting mix. The eggs hatch out into tiny, almost microscopic worms that feed on the peat moss, and often on the roots of your plants. A pinch of systemic granules placed in your pots every five weeks or so and watered in will get rid of them.

What is meant by a species being published?

In order to be a valid, recognized species a plant must be described in Latin, and this description must be published, or made public to a wide or varied audience...for instance through recognized botanical periodicals or bulletins.

Do Hoyas go dormant in the winter?

As with most tropical plants, Hoyas don't go through a true dormancy. However, when temperatures drop accompanied by overcast skies and dark days with very little light, they will slow down and show no apparent activity until conditions improve. Plants that are grown under artificial lights, and with even temperatures continue to grow and even bloom through all seasons.

Most of the tip ends of the new growth on my Hoyas dies off. What causes this?

The three major causes of stem tip burn...and that's what it is!...(1) low humidity...(2) overfertilizing...(3) stems touching a cold or hot surface. There are other causes, but check into these first.

Do Hoyas need a temperature drop at night?

Some Hoyas definitely need a temperature drop to stay happy, others don't seem to care one way or the other. It apparently has a lot to do with their native habitat. Many Hoyas live where the temperature seldom varies more than a few degrees between day and night...summer or winter.

The potting mix on some of my Hoyas has a thin layer of what looks like wet talcum powder. Could this be a fungus growth?

It actually sounds more like fertilizer salt buildup. Try leaching your potted plants with lots of clear water to wash out the excess fertilizer.

Where do most Hoyas come from originally?

The largest number of Hoya species have been collected in that vast area of the tropical world known as Indonesia. There are also numerous Hoyas scattered through many of the South Pacific Islands as well as tropical and semi tropical areas of India, China and Japan.

What are the symptoms of overfertilizing?

The first obvious symptom is a build-up of fertilizer salts that rise to the surface of your potting mix in the form of white, crusty looking powder. In clay pots these salts are visible on the outside of the pot, and around the inside rim close to the soil line. If this condition is not corrected by thorough leaching (rinsing out) of the potting medium, or a complete repotting, the roots will suffer severe chemical injury. The leaves of your plants will have dry, rusty, crinkled edges from chemical burns...and the main stem often swells and splits open near the soil line due to chemical injury of the plants plumbing system. This usually leads to the death of your plants.

Where can I get Hoya seed?

Hoya seed is not easy to come by. As far as is known, none of the Hoya dealers have seed available. Sometimes there will be individuals who have a bumper crop of seed

pods on their plants after a summer outside, where they can be pollinated by bees, flies, moths or whatever. Your best chance for obtaining Hoya seed would be to get acquainted with other Hoya hobby growers.

What is the best way to plant Hoya seed?

There are special seed planting mixes available at most garden centers. Peat moss that is packed into nylon net and compressed into thin pellets that swell to the size of a 2" pot when moistened are known in America by the brand name of Jiffy 7 pellets, and are also excellent for planting seed. The immediate concern in growing plants from seed is to prevent the fungus that causes the damp-off disease which attacks seedlings at the soil line. Mix a solution of a wettable powdered fungicide and use this mixture to dampen your seed mix or to activate the Jiffy 7 pellets. It is best to water your seed flats slowly from the bottom to prevent washing out the tiny seedling before they are firmly rooted.

Can I pasteurize my potting soil by placing it in heavy plastic bags and leaving it in the hot sun for several days?

Experimentation shows us that moist soil tied securely in a plastic bag and placed in the hot sun will reach a temperature approximately 50 degrees hotter than the surrounding air. Only if you live in an area where the air temperature is at least 135° F. (57°C.) can you be fairly certain that the contents of the plastic bag will reach the 185°F. (85°C) needed for pasteurization. It is safer to use the oven!

What are the tiny white worms that are usually found on leaves along with aphids?

Aphids go through a gradual change from the nymph stage to the adult stage by molting, or shedding their skins. As they grow, the skin does not grow with them, but instead splits open and the aphids simply walk out of their old skin. Microscopic examination reveals that the "tiny worms" referred to here, are actually the transparent skeletons...or mummies, that are left behind by the aphids as they outgrow them.

Is there a positive control for aphids besides using poison sprays?

For plants that are especially susceptible to aphids, a piece or two cut from a dog flea collar and laid on top of the soil will help to repel aphids, mealybug and scale. It is obviously too expensive to use this method if more than just a few plants are involved. It has also been discovered that any bright yellow object will immediately attract the attention of aphids and draw them away from your plants. Try smearing a bright yellow paper or a board painted yellow with petroleum jelly. Place these boards or papers close to your plants, and at plant level...not above them. The theory is that the aphids will be attracted to the yellow color and will get hopelessly stuck in the petroleum jelly.

What are the symptoms of nematodes?

Nematodes are sneaky, microscopic and practically transparent worms that invade the roots and stems of plants. Unless we have potted many plants in an unsterilized potting mix that already has nematodes present, the infestation usually starts from a potted plant received from other sources. Unrooted cuttings seldom have nematodes present unless the cuttings were taken from old wood close to the soil line. The guilty culprit that is responsible for spreading this disease usually displays some symptoms that we don't recognize until it's too late. The danger with nematodes is that they travel in water, and invade other plants on the same bench by entering the pot through holes in the bottom or by water that drips from hanging baskets into pots below. The classic symptoms are stubby, gnarled leafless stems...especially in the center of the plant which displays galls that resemble large warts. If examined, the roots may also be found to have huge knots. The plants look very sick but can survive for quite a long time in a very humid atmosphere such as in a greenhouse. This is possible because even though the roots are totally disabled, they get just enough moisture

through any remaining leaves to keep them barely alive. The remedy for nematodes is to take cuttings from the very tip ends of every plant you own, and root them far away from the contaminated area. Then burn the infested plants, pots and soil included. Scrub every square inch of your growing area, tables and benches especially, with a strong chlorine solution. If you have a dirt or gravel floor, pour left over chlorine solution on the floor and let it soak in.

I have had a beautiful H. carnosa variegata for seven years. This past summer it gradually started turning solid green. The clerk at the garden center told me I was probably using too much high nitrogen fertilizer. I use a balanced 18-18-18 formula and always have. Could there be another reason?

I doubt if your balanced fertilizer had much...if anything to do with your plant reverting to solid green. What usually happens, is that a variegated plant will eventually put out a solid green branch...this branch has very dominent genes and contains the original blueprint, or arrangement of cells that tells this plant that "it will be green". If this branch is left to grow, it will take on the role of an over ambitious supervisor and demand that the entire plant "will be green". To counteract this, cut out solid green branches as soon as they appear.

Sometimes when I water the plants in my greenhouse, centipedes will come scurrying out of the pots. Do they damage plant roots?

Centipedes are insect predators, and feed on beatles, grubs, slugs and snails that normally invade garden plants. Since centipedes don't usually hang around inside greenhouses and especially not down inside pots...I'm wondering if the bugs you are seeing might not be symphilids or millipedes. These usually feed on decaying matter such as fir bark and peat moss, but are not above eating large chunks out of plant leaves.

What is meant by "air layering" a plant?

To air layer a plant is a method of forming roots on a part of a plant while it is still attached to the mother plant. A wide notch is cut into the plant just beneath a leaf node, then a mass of wet peat moss is packed into and around the cut. A piece of plastic is securely tied over this dressing to keep the moss in place and to help to retain moisture. This method normally results in roots being formed on even the hardest to root plants within four to six weeks. As soon as a good root system is established, the new rooted cutting can be severed from the mother plant and potted up the same way as any other cutting.

Chapter 9

>>>>>>>>> Hoya Hall of Fame <<<<<<<<<

The following pages of this text are devoted to brief descriptions and a few words on care & culture of the various Hoyas whose pictures were selected for a place in our "Hall of Fame", and consist of 30 species that are generally favored for their availability, adaptability, easy growing habit, spectacular appearance...or in several cases, because they are exquisite miniatures and perfect for the indoor light garden.

Since rare Hoya species are a fairly recent addition to the world of cultivation, a large percentage of the Hoyas in our possession remain unidentified, or have been mistakenly identified. The names, or numbers accompanying the photos in this publication are those that appeared on the labels at the time of purchase, and are by no means the final word on identification for these plants. In the past few years, several research groups have been able to properly identify many of the Hoyas on these pages. In order to lessen the confusion of placing unfamiliar species names on these photos, we have chosen in most cases, to retain the more familiar number system. However, due to the fact that all plant growers have their own method for inventorying plants by number, you may have obtained many of these plants under a different name or number.

There is a fast growing, non-profit organization based in the United States but with international status, whose members are dedicated to the study and promotion of these rare and beautiful exotics. An invitation is being extended by the President of the organization, as well as members of the Board of Directors and all members in general, to those of you who grow Hoyas now, and anyone who is seriously considering growing one or more of these Hoya species and would like more information on plant sources, plant identification or culture to contact: The International Hoya Association, P.O. Box 5130, Central Point, Oregon 97502.

Hoya acuta Haworth

(Pictures #9, 21 & 65)

As you will note the name above is made up of two parts (binomial) followed by the authors name. The author is the person who originally wrote up the species and described it in Latin. "Hoya" is the genus name that represents the whole group of similar plants in the milkweed family. "acuta" is the specific name, the name of a species in the Hoya genus. I mention this now with a description of this first plant to try and alleviate confusion at this point as to why the plants are named as they appear.

This species is fairly widely distributed and relatively easy to collect in its native habitats. The plant is a vigorous grower and well adapted for our purposes. It readily grows to become a medium sized plant. Because of its wide adaptability in nature it adapts readily to cultivation. It is easy to grow and blooms readily and often. To top it all off it is highly fragrant, with scents of peppermint, spearmint and lemon.

Plants of this species have been around for a long time. It has been reported as growing at the gardens in Kew, England in 1918, having been sent there from Calcutta, India by Doctor Wallich under the name of Hoya parasitica. He stated it was from the delta of the Ganges River. The foliage on this species is very desirable, being a very attractive medium glossy green above, a little lighter on the underside. Although the internodes are rather long, the broad lance shaped leaves give adequate cover. There is a wide range of flower colors among the various clones available and also some differences in the leaf sizes. One attractive clone (picture #9) has a lime green flower color and comes from the island of Penang off the north west coast of Malaysia. It is easy to spot this species from the roadways climbing and twining around the trunks and along outstretched branches on trees bordering the mountain roads. Picture #65 is of the clone with bronze pink tones to the flowers especially pronounced when they open in cool spring conditions.

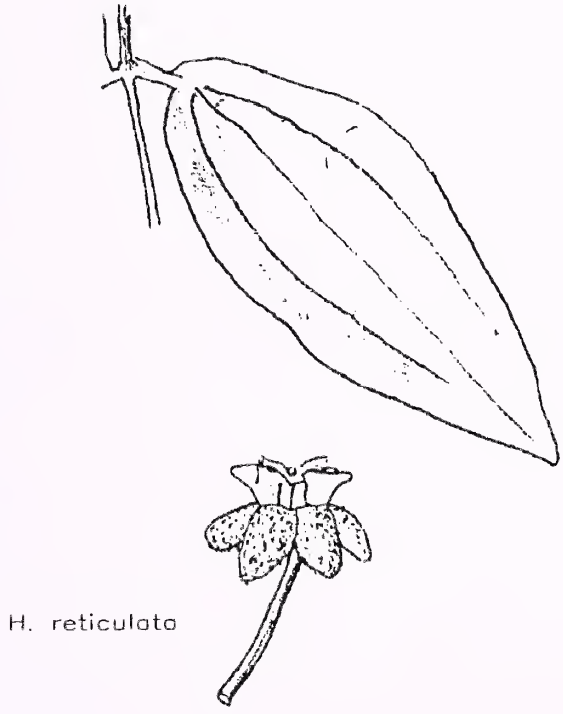
The flowers are in the form of globose (round) clusters, always waxy and with the petals reflexed. This hoya is easy to start from cuttings, grows rapidly and flowers at an early stage. If you missed seeing the development of a cluster you will know it is in bloom from the pleasant fragrance emitted.

Hoya arnottiana Wight

(Picture #3)

Here we have an Indian Hoya species from the warmer tropical regions of the Himalayan mountains. In these areas it is found growing at an elevation of from 1000' to 3000' (305 to 915 m) altitude. It is a strong, vigorous climber, ascending high into the towering branches of supporting trees, and reaching for additional sunlight. Here in its lofty perch, it is also swept by the moisture laden, cooling, monsoon breezes. It has bold, wide ovate elliptic, medium to light green leaves with a soft, smooth, hairless surfaces. The veins however can readily be seen.

The globose clusters of flowers are creamy yellow, sometimes white. The finely pubescent inner surface of the petals are reflexed, and the pure white central crown stands out prominently. It gives off a soft pleasant fragrance, is relatively easy to bloom and in combination with its bold handsome foliage, is worthy of a place in most collections.



H. reticuloto

Hoya australis R. Brown

(Pictures # 1, 52, 85)

Here is an Australian Hoya that has many leaf forms and habitats. It is adapted to a very wide range of environmental conditions, yet all the different types, varieties and subspecies have similar flowers. Because of its highly variable characteristics it has given the plant taxonomists (Botanists who specialize in the classification of plants) a lot to discuss and argue over. You can surely find this species listed by many nurseries that specialize in Hoyas. You will also find nurseries that carry numerous variations of this species. Among the many forms to choose from, you can select large, hairless, shiny leafed types; also fuzzy leafed, broad leafed, and very thick, small leaved types. Some foliage grows fairly flat, while others are cupped or their tips turn down. You can grow types with deep green foliage and ones with very light green colors. This whole book could be occupied with the many distinct types, varieties, and subspecies that can be found within the Hoya australis complex.

The flowers are always white, with the majority having varying amounts of a carmine pink stain under the central crown. For the most part the flowers lay out flat or are slightly cupped.

This species is among the easiest to grow and to flower. They tend to bloom in the fall in the northern hemisphere in September and November, as it is then becoming spring in Australia. We have many variations to choose from, thanks to the extensive collecting work done by the Australian collectors. In a crowded greenhouse you will know this plant is blooming by the scent that will greet you when you open the door in the morning.

H. australis is not as cold hardy as the carnosa types nor will it accept as much watering and humidity as most of the Philippine species. It is, however, not a fussy grower and I'm sure you will be pleased with this species.

Hoya bilobata Schlechter

(Picture #57)

At the time this species was found and described it was the smallest Hoya flower yet known from the Philippines. It was described by Dr. Rudolph Schlechter, a German economic botanist working in German New Guinea in 1906. Many Hoya specimens were sent to him from the Philippines for study and classification. The plant was collected at Davao on the large Island of Mindanao. There are a number of small leaved, small flowered Hoyas from the Philippines that belong to the same section, Acanthostemma. This section among other things is distinguished by the two extensions (lobes) that protrude from the sides of each of the five scales that make up the center of a Hoya flower. The plant shown here is believed to be this same small species, although plant taxonomists are still studying this rather difficult section of a most difficult genus, the Hoya.

Our plant with time makes a dense, multi branched, fine stemmed plant. Its diminutive oval to round leaves are covered with small soft hairs (puberulous) and are a rather dull green with light green on the cupped underside. This species would have to be included among the miniatures. It will climb, but most often the foliage dangles down in long streamers, and covers the container completely. The flower clusters are tiny, the entire umbels being only about 1/2 inch across. It is an easy plant to grow and a frequent summer bloomer, with a mild honey fragrance. As shown the rose colored petals roll back in small fuzzy balls with a yellow central crown and conspicuous, deeper red markings.

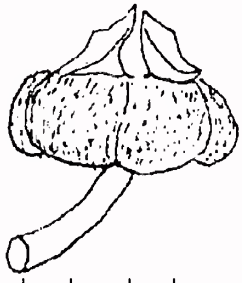
This wee plant would probably be at home in a rather small pot with good drainage. It would also do well on a log or slab wrapped with moss and watered daily. Since this plant is a fairly rapid grower you can take some cuttings later on and experiment with growing them in different situations and conditions.

Hoya camphorifolia Warburg

(Picture #44)

This graceful, pale green foliaged plant is a native of the Philippine Islands. It has small stems that form dangling and vining clumps from branches and limbs in the tropic forests in this Island nation. The Type species was found by Dr. Warburg in Central Luzon, the largest island in the Philippines. It grows at a rather high altitude of 1000'(305 m). This is not high by some standards but relatively high for this area. The foliage is about the same color on both sides, rather rigid with acute tips that bend downward. The veins are very noticeable. The petiole that holds the leaf and often the new stems are a purple shade and adds to the attractiveness of this plant. It has a rather delicate appearance, a clean attractive look.

When well grown it flowers often, the tiny flowers open in the morning then close toward evening. The next day they may open again, but are not long lasting. Since they take little nutrient from the plant they seem to bloom more often. They are a pleasing rose color with red centers, very small and beautiful. Like most Philippine Hoyas they will take a lot of water providing your mixture is loose and has good drainage. This species makes a good small to medium sized plant. It is ideal for a 6" (152.4 mm) pot or basket, where the growth habit is a pleasing contrast to the larger and more vigorous Hoyas. It is ideal for window sill growers and for light gardens. This species is not at all what I would call succulent nor is it thin, but rather somewhat hard textured. An easy plant to grow and flower.



H. halophyla

Hoya cinnamomifolia Hooker

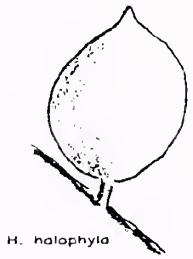
(Picture #37)

A spectacular species from the Island of Java. Its large, olive green leaves, palmately veined in silver are very impressive. The new growth exhibits bronze tones and adds to the interest of this plant species. Mr. Thomas Lobb sent this species to England from Java in 1847 where it was greatly admired. The plant itself is very attractive, but its blooms are sensational!

What could be more beautiful than the lime green petals, of these rather large sized flowers, and set off with a huge center crown of deep cranberry red? The globose clusters consist of 25 to 30 flowers each, adding to the thrill when the plant comes into full bloom. The plant is a moderately vigorous grower, but fairly easy to keep under control. In high humidity the stems will put out short rootlets along its length and especially near the nodes, where the leaves are attached. This plant can be classified as a medium bloomer. It blooms for me in Fresno, California each year about July. In England they report blooming in July and August. Some growers in America report heavy blooming in July and August with a few blooms off and on the rest of the year.

Treat the plant like you would Hoya australis. Give it a well drained potting mixture. Keep it damp but above all do not water so often that the mixture becomes sour or waterlogged, or you will lose the plant.

While on the subject of watering, the idea is to water heavily, then let the potting soil dry somewhat before watering again. Don't dabble around...Water & Wait! Also known as the drown and dry method.

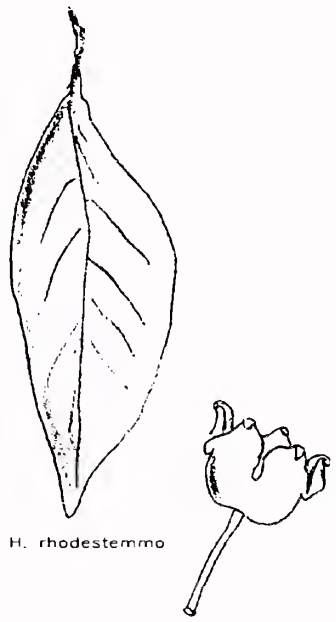


Hoya cumingiana Decaisne

(Picture #38)

In spite of forest destruction and habitat reduction, this is one species that I feel will survive. The plant pictured here came to me from Professor Juan V. Pancho, who collected it in 1981 from Northern Luzon in the Philippines. It was taken from a road cut through a limestone area, attesting to the fact that this species does not need a primary forest to survive and propagate. It readily sets seed pods and has a high percent of viable seed which grow vigorously. In this respect it is somewhat unusual among Hoya species. This is not to say that there are not other Hoya species that produce pods, but most are not as prolific in this respect as Hoya cumingiana is. Its ability to reseed itself even in disturbed areas seems to assure its permanence as a species.

This species is not a vine as most Hoyas are, but rather has a bushy type growth. As its branches become long they bow over and become pendant unless it finds support from a nearby plant or other surface. As pictured this plant has a lot of closely formed leaves, close also to the stem. The flower cluster hangs down from the arching stems and are very waxy and showy with their contrasting colors. Since this species like many others prefers coral and other limestone areas, it is advisable to include a source of calcium in the potting mix. Some crushed coral, broken up limestone, even gypsum board from construction can act as a calcium source.



Hoya erythrina Rintz

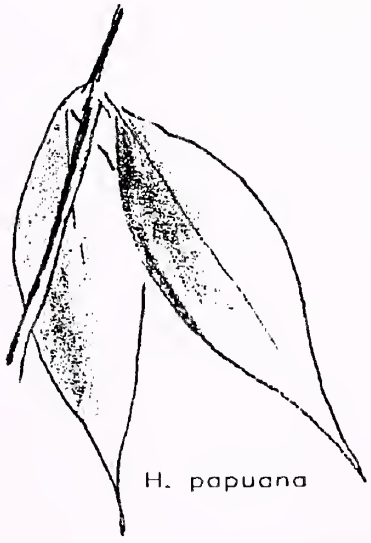
(Picture #51)

Why this beautiful Hoya escaped notice in the hill forests of Malaya until Dr. R.L. Rintz described it in 1978 is a real mystery. It is so outstandingly unusual and attractive it should not have been easily overlooked. It must be that it is fairly rare in nature in the forests of Pahang and Selangor (areas similar to U.S. counties, geographical divisions) where it is found at 1300-3000' (400-700 m) in altitude. It is said to be common but not abundant along rivers in the areas.

This plant is very slow to start growth but with time it will become established and then put on rapid growth. It loves to twine and climb... often with long, at first, leafless stems. As leaves develop they are usually deep shades of green and bronze, maturing into rather rigid, undulant (wavy) leaves of iridescent lime green with deeper green venation. The underside of these leaves is a rich dull maroon to pink. The foliage is very distinctive and beautiful, often splotched or marked on the surface with pink and silver markings. You will want to grow this one for the foliage alone!

The pendant flower clusters are formed of convex umbels of buttery yellow flowers fuzzy on the part of the upper curved surface. This is set off with a slightly lighter pagoda shaped center. There is a warm undertone to the yellowish petals. The tip and edges of the petals are turned under giving a squared off shape to the flowers.

This is a plant that most collectors will find very attractive, unique and desirable. It might be that it will like more light than most Hoyas and probably good humidity, since it grows along streams in nature.



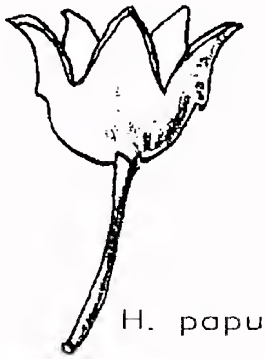
Hoya finlaysonii Wight

(Picture #75)

Each Hoya seems to have some distinctive and outstanding characteristic. This Hoya species will attract you by its spectacular foliage alone. At once you can pick this one out from all the rest. The leaves are thick and rigid, elliptic with narrowing bases. Most of all it is recognized by the contrast between the light green leaves with prominent deep emerald green venation and the deep green edge to each leaf.

In its native environment it is not a common plant. It comes from Malaya, South Thailand and Borneo. The leaves are medium sized, but can be much larger, especially when it reaches maturity. I have found that it roots slowly and takes some time before it establishes itself and really begins to grow rapidly. It may be my conditions, however I feel it is one that is worth waiting for, and once established displays strong growth.

Because of the long internodes (space between leaf pairs) it will help to wrap the plant around itself to give a more compact appearance. In hanging baskets let some stems twine around the hanger and then go on to droop back downward. The flower clusters are compact balls of reflexed waxy flowers. The centers are creamy white with some yellow tones and contrast well with the bronze-maroon reflexed petal lobes. This plant is a conversation piece with a lovely fragrance, and another species you will surely want in your collection.



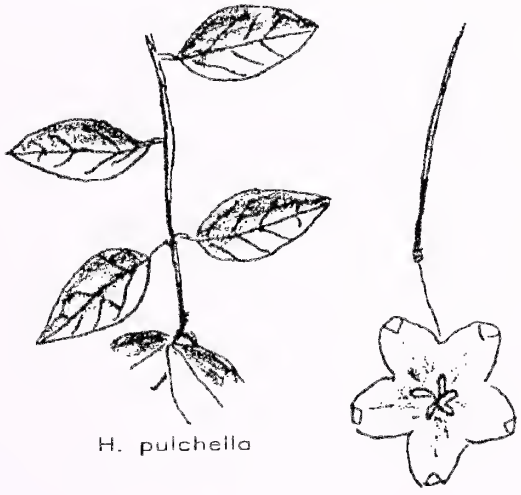
H. papuana

Hoya fraterna Blume

(Picture #115)

The plant we presently call fraterna is very distinctive, having one of the longest leaves in the Hoya genus. Not only is the foliage large, it is also thick and very rigid, with almost no venation to be seen. It is a strong grower and not a plant for limited areas. Leaves as long as a foot or more are not uncommon. The reflexed, fuzzy flowers (described as being between silky and velvety) are typical of species of this group, which includes among others Hoya kerrii, Hoya obovata, Hoya, meliflua, and Hoya diversifolia. All of this group have a compact central crown in which the outer lobes are rounded off. In addition, all these species are strong vigorous plants with thick, bold, fleshy leaves. This species, like the others mentioned above are easy to grow, and rapidly become extremely large plants. The flowers all exude a very thick nectar, or honey-dew as they age, which often stains the petals. This staining is visible in the colored photograph. As a word of caution, it is advisable that you not hang flowering plants above valuables where the honey-dew may drip on them.

Hoya fraterna is a native of the Java forests, and is reported to be difficult to bring into flower. Its rank growth, long internodes and infrequent flowering preclude its inclusion in many collections. If you have the room and would like to include a species with the longest leaves, this will be a must for you. The flowers are very similar to H. obovata but are even larger.



Hoya Fungii Merrill

(Picture #67)

The soft appearance of the foliage on this plant, along with the dark green veins, will immediately attract you to this plant. The leaves are large, and covered with soft hairs (pubescence). The new leaves are bronze green in color, maturing to an unusual shade of deep emerald green, and set off with very dark green venation. The stems, especially on new growth are a lovely bronze purple. These shaded maroon tints are a pleasant addition to an already beautiful plant.

This is a moderately cold tolerant plant that comes to us originally from the island of Hainan, off the south coast of China. The island forms the western side of the gulf of Tonkin, opposite Hanoi, Vietnam. If necessary, this species, along with the Hoya carnosa types can survive the cold months with less heat than most Hoyas. Although it has been known to survive temperatures lower than 50 degrees fahrenheit, it will be much happier if kept at...or above the fifty degree temperature range.

In addition to the beautiful foliage, another outstanding feature of this plant is its globular clusters of up to 60 flowers per umbel. The individual flowers are very similar in appearance to Hoya carnosa, but are usually slightly larger, and have a bit more fuzz on the petals. The color of the blooms will vary from pure white, to pale pink, sometimes a darker rose/pink, depending on temperature and other environmental factors.

This plant is a medium strong grower, so plan on it occupying considerable space as it matures. Curl the long stems around the pot and hanger to keep it confined and to give a more compact form.

This is an especially easy plant to grow and bring into bloom. If you are familiar with growing Hoya carnosa, then this one should be a natural for you. Among its many virtues, is also a lovely fragrance which is likely to win your heart.

Hoya inconspicua Hemsley

(Picture #45)

Here is a dainty little climber from the coastal areas of the Solomon Islands. It lives close to the sea shore in the lowland canyons along streams and trails at the edge of the jungle. The plant pictured was grown from a cutting collected in 1988, from a plant climbing a small tree along a meandering stream in filtered light on Guadalcanal Island (a famous battleground of World War II). It was in bloom at the time, and each flower was covered with tiny, buff colored butterflies, heads pointed inward to the center and their flat wings covering the entire flower. When I saw it I thought the flower was buff colored. As I reached to touch the flowers...to my surprise they took flight, revealing the rose colored flowers beneath. The insects were evidently collecting the sweet nectar from the flowers, which tastes somewhat like refined honey. This is one of the many delightful surprises one experiences in collecting plants in their native habitat.

This elegant vine is very lacy in its growth habit, with attractive, frosted, lance shaped leaves. Since foliage varies in this species it is not uncommon to find different types of leaves...sometimes on the same plant. In general the foliage is as described above, but can change dramatically depending on the growing conditions. Severe pruning of this plant will also alter its appearance, and force a very compact clump of leaves to form in contrast to the gracefully cascading plant from which the original cutting was taken. It will still develop nice long runners of beautiful new growth reminiscent of its origin. In the Islands, this plant roots in limestone crevices filled with decomposing debris. Like Hoya cumingiana, it will probably benefit from the addition of limestone in the potting mix.

Hoya inconspicua is one of the easiest Hoyas to cultivate, an excellent bloomer which opens all of its exquisite rose/red flowers at one time...often with a loud, snap, crackle and pop. The foliage is attractive and will benefit from an occasional washing, simulating the afternoon rains of the rainy season on Guadalcanal. It is happy with many varied conditions from little light to full light, from somewhat dry to very wet conditions. Keep the potting mix loose and well drained, and you should have no trouble growing and flowering this desirable species.

Hoya kerrii Craib

(Picture #7)

The "sweetheart" or "Valentine" Hoya is a very old standby. It is widely distributed in the nursery trade, so should be easy to acquire. There are several forms of this species available. The original plant came to us from Thailand and grew in the jungles of Doi Sootep, an area near Chiang Mai at 390 meters altitude. It is also found throughout the Indo China area. The very thick, succulent leaves are heart shaped giving rise to its common name. The leaves on most clones are so fleshy that no veins are visible. There is however, one variation that has very distinct veins. Another variation has a decidedly suede-like or velvet feel to the touch. Recently a beautiful variegated form was collected in Thailand. It is obvious that this species is a variable one.

Flowers also vary in size and color among the various clones. With intense collecting, other variations will no doubt show up, and the taxonomic and collector interest in this species will increase.

The leaves are opposite, as are the majority of Hoya species, and typically, from 2-6" (5-15 cm) long and nearly as wide at their widest. The "hairy" form seems to have the largest leaves. The plant is an extremely vigorous climber and needs lots of room to grow. It roots readily at the nodes and along the stems in moist conditions, making it an adaptable climber in its native habitats. It is possibly the most vigorous grower of all the Hoyas. It is equipped with an extensive, and very fibrous root system, which can easily outgrow its container within a short time.

This species is a very consistent and reliable bloomer. It has globular clusters of 15-25 fuzzy, reflexed flowers. The petals recurve almost from the moment they open. In general the fuzzy petals are white with an underlying tint of lime green. As the flowers age, the color will change to pink, then to dark, pinkish brown due to staining by the brown honeydew that is secreted from the deep brown-maroon corona, or central crown. The outer ends of these coronal lobes are rounded off and the centers are cupped. Undoubtedly, you will have to tend this plant to keep it in bounds. Try a tomato cage or a wood trellis.

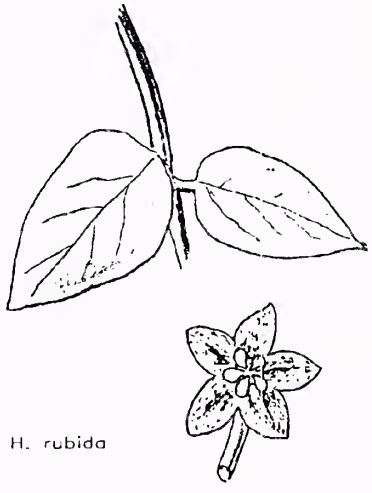
Hoya lacunosa Blume

(Picture #2)

This is an old and basic favorite in the Hoya world, and is usually available in most plant nurseries. A rather compact plant that may easily fit in the miniature classification. It will climb...but is also a good hanging basket plant, making many long streamers. The small, deep green leaves are lacunose (cupped or sunken between the veins), to give an uneven appearance to the leaf surface that is otherwise held flat.

An outstanding feature of this plant, is its superb, soft, clean scent...somewhat like hand lotion. This is a plant that is well adapted to light culture, and fits readily into even the smallest home. It blooms with rather flat clusters of from 15-20 flowers. Each flower is like a tiny ball of white fuzz with a yellow center. When the flowers initially open the petals do not at first fold back. One might think they have found a mutant branch of flowers. Watch the cluster for a day or two and as the cluster matures the flowers will take on their normal appearance. This is an easy plant to establish and grow, has clean attractive foliage, and flowers readily and often. What more could you ask?

Hoya species are divided into sections for classification purposes. Hoya lacunosa is the type species for the Otostemma section. If you read the old botanical literature you may find this plant named Otostemma lacunosum Blume.



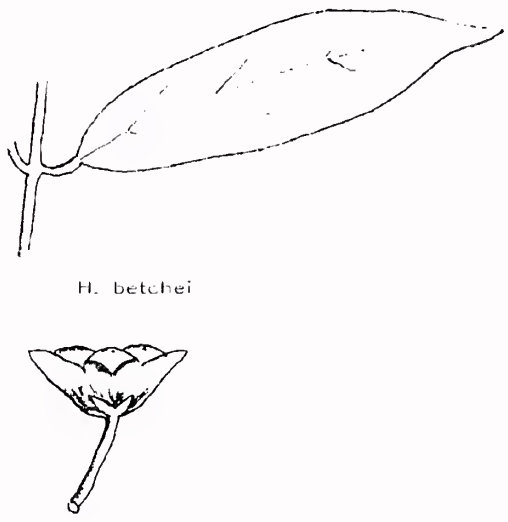
Hoya limoniaca S. Moore

(Picture #55)

Here is a graceful, clean looking plant with beautiful starry flower clusters standing out to greet you. I feel there is some doubt that the plant we are depicting is correctly identified. In any case...this plant is handsome, graceful, and has good form. Mature plants have lots of close set leaves, with many long dangling runners. The foliage is medium sized, smooth, dark, glossy green, and has a lovely vein pattern.

The species comes from a small island called the Isle of Pines, off the southern tip of the long island of New Caledonia. In World War II we used this island with its beautiful white coral sandy beaches and star pine woods as a recreation area...I wish I had known about hoyas back then! The literature says the flower is pale yellow and slightly scented. The plant in our possession with this name, can certainly pass that test. However, the description of the leaves as having apexes that are obtuse (rounded) is bothersome...our plant has very definitely sharp pointed leaf tips.

Whatever this plant is, it is a winner. Neat, clean foliage, and a good bloomer. Even without a name at all...I would keep this one.



Hoya macgillivrayi F.M. Bailey

(Picture #87)

Here is a magnificent Australian species. Our original clone came to us from the late Peter Tsang, an avid plantsman of Brisbane Australia. This species was at first thought to be a tetraploid (a plant with a double set of chromosomes) because of the flower size. It was compared to a slightly smaller species now thought to be Hoya megalaster also found in northern Queensland, Australia, but also native to the neighboring New Guinea.

Our species has been sold as Hoya superba; Big Mac; Big Big Mac, and I suppose other names as well. The blooms can be red or varying shades of purple, and are often more than 3" (76 mm) in diameter, somewhat flat and webbed far out on the petals, reminiscent of a ducks' foot. The flower clusters consist of 3-7 pendant flowers on long slender pedicels. They appear almost as Christmas ornaments hanging from fine threads. Even the fine stems do not look like they are meant to support the rather large glossy waxy leaves.

As the photo shows the flowers are crisp and waxy also and have very distinctive and attractive centers. The leaves are 4" (10 cm) long and 2" (5 cm) wide. In cultivation they are often larger. New growth is a beautiful bronze color, waxy and extremely attractive. Leaves have a heart shaped base with a long arrow shaped blade and acute points.

If left to grow without training it likes to run rampant and send out long runners...at first leafless. It needs to be cut back, or wrapped back on itself to make a more attractive and compact plant.

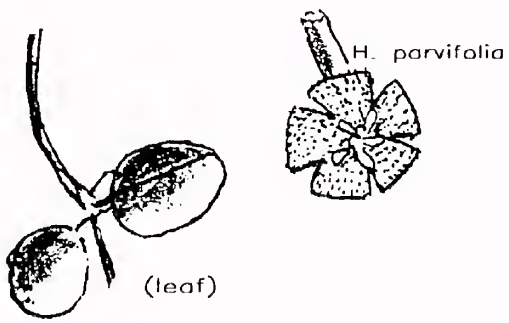
Hoya macgillivrayi is easier to grow than it is to say. It is also not difficult to bring into bloom. Do not let this Hoya get completely dry between waterings, and keep it warm. It objects to temperatures lower than 60 degrees fahrenheit. With the largest of all Hoya flowers, attractive foliage, ease of growth, and let's not forget that it has the most enchanting fragrance imaginable...it is a winner.

H o y a m e g a l a s t e r W a r b u r g

(Picture #88)

Crab claws for dinner? Here is another spectacular species from New Guinea and neighboring parts of North Eastern Australia. This species was first published by Dr. Warburg in 1907. One of the differing characteristics of this species is the narrow, star shaped corona lobes (central part of the flower) which are plainly visible in our photograph. Not only are the flowers large, distinctive and strikingly beautiful, but the foliage is deep green and attractive. Once established it is a strong and rampant grower. Plants with long internodes will be most attractive if pruned back to force branching, or wrapped back upon themselves. If you don't keep this one under control, it will find its way to the nearest light source. In the greenhouse it will quickly reach the peak of the roof, seeking additional light.

These plants are especially attractive when trained on wire tomato trellises, or hoops...wrapped in, out and around to produce a beautiful specimen plant. When a plant like this blooms with 3-7 large flowers, bring in all your friends to see it. It is a knock out! This species has some beautiful flower color variations, so don't settle for just one if you have the room. There are some almost black red types that are certainly worth sneaking into your collection. Always keep a few cuttings going to share with friends, and to insure against loss of the original plant. Occasionally mature Hoya plants will die for no apparent reason. If a plant looks unhealthy, take some cuttings immediately.



H. parvifolia

Hoya meliflua (Blanco) Merrill

(Picture #86)

Way back in 1837 a Spanish priest by the name of Father Blanco collected and named a plant Stapelia meliflua. Dr. Merrill who worked for the United States Department of Agriculture in the Philippines as director of the Bureau of Science in Manila, determined that this plant was a Hoya and also synonymous with another species...Hoya luzonica described by Dr. Schlechter of Germany. He combined the latter and named the plant Hoya meliflua. It was said to be the only species still found in the vicinity of Manila, and generally distributed in the region from which Father Blanco secured most of his botanical material. It is a little more complex than this but this plant now goes by the heading name.

The leaves of this plant are deep, glossy green, and very thick, showing no veins. It, like Hoya fraterna, which it resembles (many growers still call this plant "the small leaved fraterna") is a very strong grower, but is a much better bloomer than the latter. Here is a plant that is easy to establish, has strong growth, and blooms readily. The spectacular, globose flower clusters are fuzzy, and deep pink. Like Hoya kerrii they do exude a colored (almost black) honeydew which stains the petals of the older flowers. This characteristic is plainly visible in the photo. Compare the central crown of this plant with that of Hoya kerrii and see the similarities.

In Father Blanco's 1837 description, his last words are "Flor. en Jun. *T, Balicbalic". This means it flowers or was in flower in June and its name in Tagalog, the native language, means "back and forth". More correctly as an old German friend of mine who worked in the long greenhouses at Armstrong Nurseries used to say to me "all day I go Forth and Back". I do not see the significance of the Tagalog name unless the name refers to the plant twining out and back or that it is a repeat bloomer, in and out of flower.

Hoya nicholsoniae F. Mueller

(Pictures #32, 36, 90)

We are fortunate to have many fine clones of this beautiful Australian species to choose from. This is a variable species native to a wide range of environmental conditions in Northern Queensland. Our wide range of selection is due for the most part to the extensive collecting done by David J. Liddle of Mareeba, Queensland, Australia.

In its native habitat it is usually epiphytic and found in a wide range of habitats from sea shore to highland mist forests. This Hoya is easy to grow due to its very wide adaptability. It roots easily from cuttings, grows rapidly and blooms readily.

The plant and stems are entirely without hairs (glabrous), and its foliage is waxy with prominent palmate venation. The leaves are mostly flat but in some clones the edges recurve slightly and the tip bends under also. The foliage in some clones become bright red or purplish if exposed to high light intensities or fed high phosphate fertilizers. This makes for an extremely different and desirable plant. The flowers are in semi-globose clusters of 10-30. They are generally cream to yellow in color, however there is one clone with a definite light brown tint, and at least one that is a startling blue green. All of these colors are normally flushed with pink overtones. The reflexed petals are covered with a very fine pubescence, appearing to general observation to be glabrous. The starry, prominent central crown is glossy white. If you have room, this is one species of which you may want to grow several different clones.

Hoya nummularioides Costantin

(Picture #78)

There is some question as to the true identity and thus the true name of the species depicted here. The clone pictured came to me from the Sakdi Sir Orchid Nursery in Bangkok, Thailand. It was evident that the 5 plants received were of at least two types, maybe even two different species. They appeared to have been whacked from tree trunks or branches with a machete as some slices of bark and sapwood were still attached. The one pictured here blooms regularly each fall (early October), here in Fresno, California, whereas a slightly larger leafed clone, with rusty leaf coloring, blooms one month later in November.

This species blooms only once a year, but what a profusion of bloom!. Nearly every node puts forth an umbel of blooms, with from 7-15 small white flowers which have a soft, pink center, and a mild but spicy fragrance. The flower stem is deciduous and thus drops off after completing the fall bloom. This action is not common among Hoyas, as most normally retain the bloom stem (peduncle) and bloom successively from it. There may be at least 7 different clones of this...or closely related species in commerce, so your plant may vary slightly from this description.

The plant has a rather upright growth habit and with age, some looping branches. The leaves are slightly cupped downward, and are a rather dull, olive green and covered with fine hairs, which gives the plant a suede-like or velvety appearance. Only the flowers are glabrous (clear of hairs).

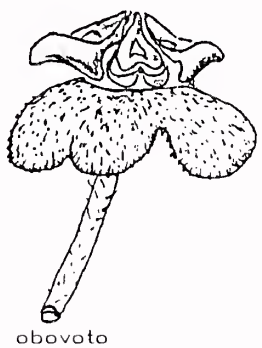
This plant likes a small pot, so do not over pot this one. In addition it will grow well on the dry side, and seems to like a lot of light, but not bright noon-day sun. The leaves are attached so they can be swiveled readily on their axis, which is novel and a little unusual...It is a darling!

Hoya obovata Decaisne

(Pictures #13, 14)

Perhaps the all time number 1 champion for blooms. This strong, vigorous growing Hoya has thick, fleshy, very round leaves, showing no veins. The color is medium green, splashed liberally with flecks of pink and white, sometimes silver or grayish green. The plant is a climber, and will need lots of room. It sends out long runners...at first leafless, but eventually developing the fleshy round leaves. It may even bloom from these runners before the leaves are well developed. With high humidity it will develop small rootlets along these stems and at the nodes. New growth will have slight tints of reddish pigmentation that will disappear as the stem matures. This one is easy to start from cuttings, and with good light, will bloom practically year round. Expect clusters of 20-30 fuzzy, white to light rose colored flowers in a semi globose shape with deep carmine red centers. As with Hoya kerrii, Hoya meliflua, Hoya diversifolia and other closely related species, this one exudes a lot of honeydew. In this case the nectar is clear instead of the dark brown color of the others.

Hoya obovata is said to come from the Straits of Bhutan in the Moluccas. I believe we have only one clone of this plant in cultivation, and it would be nice if we could obtain others. Our present plant, however has a lot going for it. A heavy clay pot is almost a necessity for this heavy vine, and something like a redwood or cedar trellis to climb on. Wire tomato cages also make good supports. If the plant becomes completely unmanageable, drastic pruning does no harm...the plant will bloom even more profusely the following year on the new growth.



H. obovoto

Hoya obscura Elmer ex Burton

(Picture #27)

More cuttings of this species are received from native collectors in the Philippines each year than any other. This may be an indication that it is very plentiful...or so attractive that it always catches their eye.

This plant is easily recognized by its glossy, wax like, distinctively shaped and veined leaves. Although the leaves may vary in size, they retain a definite recognizable shape. Many cuttings, when first received, will have small, very thick leaves. Once they are established and begin to grow, the leaves enlarge and are much thinner. They also become a lighter green. This is another species whose leaves will turn deep bronze-red when given more light or high phosphate fertilizers. This is only true of some clones, and is true of the first clone sent to the United States by the late Peter Tsang. There are more recent introductions that do not have this tendency.

In the Philippines this plant has found its way into the nurseries and into their landscaping. One very effective way it is displayed and grown is by rooting it on coconuts...husk and all. It is pinned in circular fashion around the husk which in turn is hung from a wire hooked into the coconut. This is a constructive use of readily available native materials, and makes a beautiful hanging basket display.

This plant is an epiphyte, with compact bushy growth, and makes an excellent house plant. A wonderful light garden subject...It seems to be almost immune to pests, even mealy bugs will by-pass this plant in favor of something more appetizing. Outdoors, snails will mow it down if they can get to it...so keep some snail bait handy!.

Like most Philippine species, it loves a lot of water and humidity. It will be happy to be washed off occasionally also. Do not let this plant dry out to where it becomes completely dry...it will wither from too little water. The flower clusters are flat and made up of dainty, fuzzy, cream to pink balls of fluff that smell lovely. The fragrance is mild and certainly not over powering...just nice. Every Hoya collector should have at least one clone of this exceptional plant. Like Hoya lacunosa this is another species in the Otostemma section.

Hoya pauciflora Wight

(Picture #104)

This glabrous narrow leaved plant comes from south West India and the neighboring Island of Sri Lanka (Ceylon). It is a compact, thick stemmed, bushy grower. In nature it is found matted over boulders in the moist forest regions or scrambling on tree trunks in the low mountainous areas, but also up to 5000' elevation. It seems to prefer shady places...so might flower better in subdued light and with high humidity. It can not really be considered a climbing vine, but rather a bushy rambler. The internodes (section of stem between leaf pairs) are irregular and this gives rise to clumps of leaves. The narrow leaves are rather rigid, deep green, with slightly turned under edges, cupped in the center with no visible veins. The leaf point is blunt.

In moist areas and with the high humidity of a greenhouse, this species will readily form many adventitious roots, mostly at the nodes, but also occasionally from the internodal areas. It is thus well adapted to clinging to rough rock surfaces. You might try growing this plant on a rock support. It is a shy bloomer and usually has only a pair of flowers at a time. It is reported in the literature that the plants from the Sri Lanka area are good bloomers. This statement is a contradiction of the plants' name, as the name itself, "pauciflora" actually means few flowers. Let's hope that with further collecting we may find clones that flower more readily.

This would be a good subject for the hybridizer, since the flowers are real beauties...very fuzzy, pure sparkling white, slightly bell shaped, and with a deep raspberry red central crown. If we could, through hybridization, produce a lovely little compact plant with loads of these fascinating, pure white, wonderfully fragrant flowers, we would all benefit from it. Many of our fuzzy white flowers are sparkling crystal white, This is due to the hair cells being hollow, sharply and narrowly pointed, readily reflecting light. If you are patient and experiment a little with its environment, you can probably get this one to bloom. It is certainly worth the effort. Let's hope some collector will reward us with additional clones of this lovely Indian Hoya species.

Hoya pentaphlebia Merrill

(Picture #113)

This is a big, bold leafed hoya, measuring 3 1/2 to 6 1/2 inches long, and very broad...some leaves are almost round. They are waxy, glossy medium green above and a lighter, dull (not waxy) color on the underside. The margins are undulant (wavy) and appear crimped due to their size and texture, and often turn under slightly. The five primary (Penta) veins are readily visible. The new foliage often exhibits some bronze toning, and on these leaves the pale venation stands out vividly.

The glabrous flower clusters are made up of 25-35 yellow starry flowers. The edges of the petal...lobes as well as the tip turn under yielding a spoke like flower. The yellow petals are slightly reflexed, and enhance the raised, star shaped, pure white center crown. This Hoya is a joy to see in bloom. Although the flowers are not large, they are exquisitely different. The color is actually a rather buttery yellow. The plant blooms periodically from early spring through October. You will observe a clean, sweet, citrus fragrance from the blooms both day and night. This is a peculiar trait, since most Hoyas are fragrant at night or late evening only...reaching a peak of fragrance the first night, then with successive, diminishing peaks the following nights.

This Philippine Hoya species described by Dr. E.D. Merrill in 1918 was based on a plant collected in the Cauayan Valley on the Island of Samar in 1914. The flowers are very similar to at least two other Philippine species, the differences lie in the foliage size and in their dissimilar central crowns among the visible difference, and in their different pollen structures. With its large foliage it is well clothed and makes a very attractive plant. This species can be considered a medium to large plant of moderately strong growth. In its native habitat Hoya pentaphlebia is not a plentiful species.

Hoya plicata King and Gamble

(Picture #81)

In 1981 Ted Green of Kaaawa, Hawaii and I were on a collecting trip through Australia, Java, Singapore, Malaya and the Philippines. At Kuala Lumpur University in Malaysia, Dr. Chin had provided us with an experienced collector, and transportation. One of our excursions took us from the flat lands of the capitol area, to the east and the mountains. On a road that leads to the resort area of the Genting Highlands, at elevations where the mist forests occur, and about half way up the mountain on a paved road, we came upon a recently cleared swath cut down the hill...through the forest, to provide eventually for a tramway. All the trees and other plants had been felled, making this an ideal locality to search for Hoyas and other plants that ordinarily live in the tops of huge primary jungle trees and are totally inaccessible. Walking up a twisted trail...weaving in and out of these fallen giants, we came upon orchids, ferns, gesnariads and other exotic plants. In a bend in the path and under a large tree, I spotted the Hoya depicted here. It was not in flower, but who cared!.

This is a beautiful plant, with very dark green (almost black) lacunose leaves (leaves with sunken areas between the veins). Being a medium grower, and rather compact...it makes an ideal basket or hanging plant and is also suited to the light garden. Another advantage is that it flowers at a very young age. The flowers are rather stiff and the colors are not strong, but it has some strikingly beautiful shapes as it develops. At maturity the petals roll backwards from the upright center. This species is such a profuse bloomer, that the many flowers often hide the foliage.

This plant has been confused with Hoya micrantha even by professional botanists. Complex chemical analysis however, shows the two to be distinct.

Hoya polyneura Hooker f.

(Picture #76)

This Hoya is a native of the Himalayan region of India. My first plants of this species were sent to me by Mr. Genash Mani Pradhan of Genash Villa, Kalampong. This beautiful village is nestled against the Himalayan Mountains. Genash tells me that this species grows as an epiphyte with its long flexible branches hanging from the lateral branches of large trees which are bathed with the monsoon breezes. It is found at high altitudes of from 3000'-5000' elevation. The plant was first named and described by J.D. Hooker in Flora of British India in 1883.

This plant is not a vine...but instead, has graceful, downward curved branches that bend from their own weight. The branches are clothed with fleshy, light to medium green leaves with prominent and distinctively parallel veins. The leaves remind some of fish tails, and it is sometimes referred to as the "Fish Tailed Hoya". The paired leaves are held flat and are variable in size, mostly 3-4 " long when mature and 1-2 1/2" at their widest point. The flower clusters are borne from below the nodes, under the paired leaves, and are usually attached directly to the flowering branch with little or no bloom stem...so the flowers are only visible from below. For this reason, if the plant is positioned high you will be able to enjoy viewing the flower clusters when your plant blooms. The reflexed white to cream corolla contrasts sharply with the clear red-purple color of the corona in the center. It is a true beauty!.

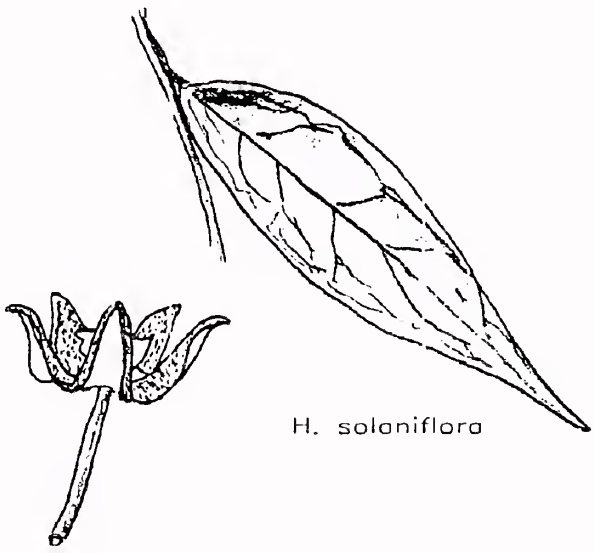
This plant should be grown cool, with high humidity. Do not let the well drained potting mixture dry out. Air movement and uniform conditions will help this plant achieve its full potential.

Hoya pseudolitoralis C. Norman

(Picture #54)

You will find this a beautiful clean attractive plant with strikingly beautiful, graceful flower clusters. It is a joy to have around...in or out of bloom. The foliage prefers to stream down over its container edges, rather than climb upward. The fleshy nature of the stems and leaves is pleasing to see. The rather flat, broad, medium sized leaves are not always uniformly green, which adds to its interest. New growth is often a beautiful bronze an the upper surface and a dull pale green below. Mature leaves are often deep dark green with a dark maroon edging, It is not unusual, however, for the new growth near the ends of stems to be mottled with yellowish and pink tones. I would grow this one for the foliage alone.

The species is native to New Guinea and was originally described from a plant collected by L.J. Brass on 23, February 1934 at Dagwa, Oriomo River, Western Division, British New Guinea at a low altitude (40 meters). The flowers, as shown in our color photograph, have a delicate and dainty appearance. The fuzzy, bright white corolla is a wonderful backdrop to the sloping pagoda shaped, soft pink crown in the center. The whole appearance of the plant and flowers is graceful and pleasing.



Hoya pubicalyx Merrill var. Chimera

(Picture #68)

Enough good things can't be said about this outstanding Philippine species. In addition to all the good attributes of the species itself, this particular type of variegated plant can be a true eye catcher and a valued conversation piece. This will be especially true when it bursts into bloom or visitors view colored pictures of the flower clusters.

As a chimera (a special type of variegation) the plant is full of surprises. The lush, glossy foliage is a virtual rainbow of colors, it can exhibit irregular sections of purplish colored leaf tissue...especially visible on the young growth and newly formed leaves, but it can also be streaked and splashed with silver, pink, maroon, iridescent green and even brown. The new stems are usually purplish brown, as are the leaf petiole and often the leaf midrib.

When it blooms you are in for further surprises. Flowers of mixed colors are not unusual, color mixing within individual flowers, as well as different flowers within the globular clusters. Each cluster may appear different with occasional clusters of very dark, almost black flowers, others may have clusters of light pink, bright rose, or deep pink flowers. It is fun to look for branches exhibiting unique color patterns and select them for cuttings to start new and improved plants. It would be hard to believe that anyone could ever grow tired of this uncommon plant.

While we are here let's look at variegation and chimeras. Variegation is widespread in the plant kingdom, even in the Hoya genus. Chimeras are a little more rare. Variegation may be irregular in form, or regular and more or less controlled. As with most botanical phenomenon, this can become a very complex topic. For a very long time we have had variegated Hoyas. Hoya picta var. argentia and Hoya picta var. aurea are referred to in 1853. These variegated species are still around today. Hoya compacta, Hoya bella, and Hoya australis are additional species with variegated forms, and just recently we acquired a gorgeous variegated multiflora. Chimeras like this H. pubicalyx, are irregular in their expression of color and thus full of delightful surprises.

Hoya purpureofusca Hooker

(Picture #46)

The name of this Hoya has been attached to a mislabeled species for many years, and has led to much confusion. If you have a plant or receive one with this name, look at it carefully. If you have a plant of H. cinnamomifolia, or know someone who does...compare the two. The foliage of the real purpureofusca is practically identical. Your plant should have large, broad, glossy green leaves, with palmate venation. If you find that your plant has different venation (pinnate) it is most likely the old "Pink Silver Vine" and probably should be labeled Hoya pubicalyx.

The flowers are also similar to the flowers of H. cinnamomifolia, but are an entirely different color, and are referred to as the "Brown Purple flowered Hoya".

This plant comes from the forests of Java, and was sent by Thomas Lobb, an English collector, to the nursery of Messrs. Veitch in Exiter, England where it bloomed in September 1849.

This species will bloom with large clusters of fuzzy, reddish brown flowers that have a very deep red center, from July through September. If conditions are to their liking they may even bloom in November, December or at some other time.

One of the attractants for pollinators, in addition to color and fragrance is the sweet honey it exudes..note the clear honeydew on the flowers. This is an absolute must have for all Hoya collectors.

Hoya serpens Hooker

(Picture #8)

This species comes to us from the mountains of Sikkim in the Himalayan region of Western India. This is a relatively cool area, bathed by monsoon winds and periods of much mist and rainfall. Like many Himalayan foothill species, this plant likes cool growing conditions. the leaves are round and very small, deep green in color and have an irregular surface with many fine, very short hairs on both surfaces. The plant branches readily making a dense mat of foliage. The flowers are noticeably larger than the leaves. The flowers are extremely fuzzy, and when first opened, are mint green, or sometimes slightly yellow green in color. This color deepens with age and finally turns to pink. On plants in full bloom, all these colors can be present at one time as successive umbels open and mature. My plant finally became happy after I wrapped a short 20" piece of tree trunk, about 8" in diameter with some moss, tied a mat of this species on with some green, elastic plant tape. This log was placed on the gravel floor of my hot house and in full shade, where it is misted automatically 5 minutes each hour during the warm months. (see picture #108) During the dull winter months, I place it high on a steel stool giving it a little more light. Since adopting this new planting method, the plant has survived and flourished. After two years my latest plant is healthy, well clothed with lush, dense foliage, and completely happy with this new treatment (picture #108). Grown in this manner it is almost impossible to overwater.

This species is not easy to bloom but seems to produce bloom from the pendant portions of stems that hang down from the main part of the plant. Some growers report that it is happy in a terrarium. It is a true miniature, so will adapt readily to this confined culture. Another way it has been successfully grown is in a low, bowl shaped container of loose potting media with a porous rock in the center over which it can sprawl and root.

Chapter 10

The following pages include 114 additional Hoya species, briefly described, with guidelines for the minimum temperature range that individual species should be subjected to. (W) warm..above 60° F. (26° C). (M) medium..above 50° F. (12° C). (C) cool..generally above 40° F. (7° C). Note that these are only suggestions. The majority of Hoyas can adapt to slightly cooler temperatures if kept on the dry side. Just remember that all Hoyas are considered tropical or sub-tropical, and although a few species (H. carnosa, compacta, globulosa, serpens and polyneura) can survive cooler temperatures, and even a light frost for a short period of time, they love the warmth, and do best if kept at, or above their minimum temperature range.

Picture #1.. H. australis..Described on page 64..The clone pictured is not a typical flower for this species, in that the petals are normally pure white. The pink polka dots on the petal tips were a pleasant surprise. (M) Photo by Ann Wayman

Picture #2.. H. lacunosa..Described on page 75. (M) Photo by Ann Wayman

Picture #3.. H. arnottiana..Described on page 63. (C) Photo by Ann Wayman

Picture #4.. H. pubicalyx cv. 'Fresno Beauty'..A registered H. pubicalyx seedling. Glossy green foliage, heavily speckled with white. Dark rose red flower with white crown. (M) Photo by Henry Raphael

Picture #5.. H. kenejiana..Dark green wiry climber. Cheddar cheese yellow flowers with white fuzz on the corollas, pure white crown. (M) Photo by Henry Raphael

Picture #6.. H. multiflora..Small, dark yellow flowers shaped like shooting stars, with white crown and purple center. (W) Photo by Ann Wayman

Picture #7.. H. kerrii ..Described on page 74. (M) Photo by Ann Wayman

Picture #8.. H. serpens..Described on page 91. (C) Photo by Ann Wayman

Picture #9.. H. acuta (green form)..Described on page 62. (M) Photo by Ann Wayman

Picture #10.. H. sp. from tanna..Dark green, thin leaved species, with milky white, slightly cup shaped flowers, and a very pale pink crown. (W) Photo by Ann Wayman

Picture #11.. H. pachyclada..A shrub type Hoya with waxy, pure white, ball shaped corolla and a white crown. Very thick olive green leaves. (M) Photo by Henry Raphael

Picture #12.. H. sp. Bangkok #4..Thick, oval shaped, olive green leaves. Pure white, extremely waxy flowers with a deep rose red center. (M) Photo by Ann Wayman

Picture #13.. H. obovata..Described on page 82. (M) Photo by Ann Wayman

Picture #14.. H. obovata (foliage)..A close-up photo for those of you who have not as yet determined whether you have H. kerrii (the sweetheart Hoya), or this plant, with it's round, lightly spotted leaves. Photo by Ann Wayman

Picture #15.. H. fuscomarginata..Identity of this plant is not certain. Huge umbels of creamy yellow flowers with a deep pink crown that has dark, dusty rose tips. Foliage on this plant is magnificent..huge, dark, glossy green leaves with purple margins and a beautiful vein pattern. (M) Photo by Ann Wayman

Picture #16.. H. Mini Belle..This plant appears to be a hybrid cross between Hoya longifolia, or Hoya shepherdii and Hoya carnosa. Perfect ball-shaped umbels of sparkling pink flowers with pink crown and dark red center. Dark green, stringbean shaped leaves. (C) Photo by Ann Wayman

Picture #17.. HSI #458..An unidentified Hoya species with pale pink fuzzy petals and a darker pink center. Very dark green, lance shaped leaves. (M) Photo by Ann Wayman

Picture #18.. H. diversifolia B...Another plant whose true identity is unknown. These leaves are enormous, as large as a dinner plate, very thick, glossy green and spattered with silver blotches. The huge flower umbels are perfectly round with up to 60 small white to pale yellow flowers. The crown is white with a pink or sometimes orange center. (M) Photo by Ann Wayman

Picture #19.. H. polystachya..Another giant leaved plant from Java. The flowers are very tiny, brown on the tips, shading to tan toward the center. The crown is white. These flowers form on bloom stalks that are shaped like deer antlers. (M) Photo by Ann Wayman

Picture #20.. H. sp. Chiang Mai..This plant has been identified as Hoya subquintuplinervis. One of the waxiest of Hoya blooms, the buds open a pale green, and slowly turn to light pink with a white crown. Very thick olive green leaves. (M) Photo by Chuck Everson

Picture #21.. H. loherii (foliage)..These leaves grow straight up, are hard like cardboard, and the sides curl under like an inside out canoe. They are medium green on the outside and a dull pale green on the underside. (W) Photo by Ann Wayman

Picture #22.. H. loherii..This plant has been in cultivation for a few years, but because of the odd upright foliage, was thought to be a Dischidia. The blooms are tiny, very fuzzy, and a glowing bronze color. (W) Photo by Dale Kloppenburg

Picture #23.. H. sp. F-484..An unidentified species from Borneo. White, fuzzy petals roll backward into a ball. Beautiful, shiny, glossy green, cascading foliage. Fragrance of allspice. (W) Photo by Ann Wayman

Picture #24.. H. littoralis..Graceful, cascading, dark green, lance shaped foliage. Dainty, dark rose colored flowers with white fuzz at the base of the petals, dark reddish purple crown. (W) Photo by Ann Wayman

Picture #25.. H. compacta..The Hindu Rope Hoya. Tightly curled and twisted leaves cling to long dangling branches, and look like knotted rope. The flowers are white or sometimes pink, and grow from bloom spurs that form between the leaf stems. This plant also comes in several versions of beautifully variegated foliage. (C) Photo by Ann Wayman

Picture #26.. H. calycina..A dazzling pure white Hoya with a deep red halo under the white crown. Large, very fuzzy leaves that feel like velvet. (M) Photo by Ann Wayman

Picture #27.. H. obscura..Described on page 83. (W) Photo by Ann Wayman

Picture #28.. H. pubicalyx cv. 'Red Buttons'..The heavy fuzz on the red petals of this Hoya makes it look almost black. The crown is a beautiful cranberry red with black in the center. (M) Photo by Ann Wayman

Picture #29.. H. pubicalyx cv. 'Bright One'..Another pubicalyx cultivar that deserves recognition. Beautiful, iridescent mauve color, with white fuzz on the tips of the petals. The crown is pale pink with a deeper pink center. (M) Photo by Ann Wayman

Picture #30.. H. ischnopus..This may not be the correct identity for this plant. It opened over a period of about four days, first pale yellow, then turning pink. A wiry climber with dark green leaves. (W) Photo by Ann Wayman

Picture #31.. H. bella..Probably the most photographed Hoya in existence. Medium sized, pure sparkling white flowers with deep carmine red center. This is the variety 'Paxtonii' and has longer diamond shaped leaves, slightly wavy on the edges, and larger flowers. The form of H. bella that we are more familiar with, has very small diamond or lance shaped foliage that cascades beautifully from a hanging basket. (M) Photo by Ann Wayman

Picture #32.. H. nicholsoniae..(IML #37)..beautifully veined foliage adorned with golden yellow flowers and a pure white crown. (M) Photo by Ann Wayman

Picture #33.. H. shepherdii..Called the "stringbean Hoya", due to the long stringbean shaped leaves that dangle like stringbeans from a vine. The flowers are small, white or pale pink with a white crown and a dark pink center. (C) Photo By Ann Wayman

Picture #34.. H. citrina..It is uncertain whether the plant portrayed here is actually citrina. This was the name on the label at the time of purchase, so unless, or until it is proven otherwise, it will continue to carry this name. The flowers are white, sometimes pale yellow, very waxy, and has beautiful, big, bold leaves. (M) Photo by Ann Wayman

Picture #35.. H. Sp. CI-1244..A neat, clean growing plant in the Hoya acuta complex. The leaves on this plant are smaller and thicker then most acuta types. (M) Photo by Ann Wayman

Picture #36.. H. nicholsoniae..(IML #39)..Gorgeous, heavily veined foliage. The flowers on this plant are creamy yellow with a 'cotton candy' pink center, good bloomer. (M) Photo by Ann Wayman

Picture #37.. H. cinnamomifolia..Described on page 67. (M) Photo by Henry Raphael

Picture #38.. H. cumingiana..Described on page 68. (M) Photo by Ann Wayman

Picture #39.. H. gracilis..This beautiful little plant came from the Isle of Ceram in the Celebes. The small lance shaped foliage is speckled all over with silver. The flowers are small but exquisite. The pink petals are heavily covered with white fur, but the very tips of the petals are dark pink. The crown is the color of ripe watermelon. (W) Photo by Ann Wayman

Picture #40..H. neoebudica..This tan or slightly orange flower looks as if it were sculptured in wax, with a luscious contrasting pink center. Foliage is glossy green with beautiful veins. (W) Photo by Ann Wayman

Picture #41.. H. pubicalyx cv. 'Pink Silver'..Most of us have at least one of these in our collections. The foliage is beautifully patterned with silver, white, pink and sometimes maroon. The flowers are stunning and can be any color from bright wine red, to purple, or like this one a delicious cotton candy pink. (M) Photo by Ann Wayman

Picture #42.. H padangensis..Perhaps the most unusual shaped Hoya, with petals whose sides curl under to form tight little rolls. This Hoya can bloom light brown, pale pink or off white with a prominent pure white crown. The buds are a perfect star shape. The foliage is dark olive green, often with some silver streaking. (M) Photo by Ann Wayman

Picture #43.. H. sp. PNG 4..Dark green dangling foliage, with prominent veins. Medium sized, slightly fuzzy flowers are pinkish purple, with dark, port wine colored crown. (W) Photo by Ann Wayman

Picture #44.. H. camphorifolia..Described on page 66. (W) Photo by Ann Wayman

Picture #45.. H. inconspicua..Described on page 73. (W) Photo by Ann Wayman

Picture #46.. H. purpureofusca..Described on page 90. (W) Photo by Ann Wayman

Picture #47.. H. caudata var. crassifolia..Flowers on this Hoya are small to medium in size, pure white to pale pink in color, with long silky, white hairs on the petal edges. The center crown is dark rose red with long, white hairs protruding from the center. New leaves are iridescent, emerald green, with silver blotching, as they age they become hard as cardboard, and exposure to bright light will turn the spotting on the leaves to bright pink or maroon. (M) Photo by Ann Wayman

Picture #48.. H. odorata..True to its name, this Hoya has a lovely, spicy, citrus fragrance. The leaves are very thin, and copper colored when new. The branches are long, and cascade gracefully from their own weight as they age.

The large, pure white flowers have a startling bright yellow crown, and form on pedicels that grow directly from the leaf axils instead of on long bloom spurs. (W) Photo by Ann Wayman

Picture #49.. H. sp. PNG 1..Probably the same species as PNG 4. This particular clone has narrower leaves. The flowers are brownish red and form large, spherical umbels. (W) Photo by Ann Wayman

Picture #50.. H. pottsii..The likelihood of this plant being pottsii is doubtful. The foliage is bold and beautifully veined, turning shiny cordovan brown in bright light. The flowers are very waxy, white or slightly tan, with a white crown and a dark rose colored center. (M) Photo by Ann Wayman

Picture #51.. H. erythrina..Described on page 69. (W) Photo by Ann Wayman

Picture #53.. H. diversifolia..The large, thick, succulent leaves on this plant are variable and can be oval shaped, long and broad or other shapes as well, on the same plant, thus the name diversifolia. The dusty rose to slightly orange colored flowers are small and very fuzzy, with a deep pink stripe down the center of each petal, the crown is dark, rose red. (M) Photo by Henry Raphael

Picture #54.. H. pseudolitoralis..Described on page 88. (W) Photo by Ann Wayman

Picture #55.. H. limoniaca..Described on page 76. (M) Photo by Ann Wayman

Picture #56.. H. sp. CMF-8..This gorgeous plant from the Philippines has dazzling, dark green leaves, attractively net veined in white. The creamy yellow flowers are very waxy, have a pretty pink crown, with dark pink petal tips and center. (W) Photo by Ann Wayman

Picture #57.. H. bilobata..Described on page 65. (W) Photo by Ann Wayman

Picture #58.. H. micrantha..Medium sized, very hard, cardboard-like leaves are dark grass green and have a graceful cascading habit that makes a beautiful basket plant. The flowers are tiny, pale pink, and very fuzzy with a stunning rose red crown. (M) Photo by Ann Wayman

Picture #59.. H. sp. PNG 6..Gorgeous, heavily veined foliage makes a beautiful back-drop for these rather small, fuzzy flowers. They are a peculiar color, being neither brown, pink or orange, but somewhere in between. (M) Photo by Ann Wayman

Picture #60.. H. poolei..Dazzling, fuzzy, sugar white flowers with a delicate, translucent pink crown and a dark pink center. Foliage is dull gray green, but turns reddish bronze in bright light. (W) Photo by Ann Wayman

Picture #61.. H. tsangii..Formerly sold as H. sp. DS-70, and also as H. angustifolia. This pretty little plant is a "blooming fool". Blooms practically year round, displaying hundreds of tiny, very fuzzy pink flowers. The crown is dark pink with yellow tips. The leaves are dull gray green due to the heavy, short white fuzz that feels like felt or suede. (M) Photo by Ann Wayman

Picture #62.. H. merrillii..Absolutely stunning foliage adorns this plant. Leaves turn a dark, shiny, cordovan brown in bright light. The starry flowers are pale, creamy yellow with petal tips that curl under at the sides and tip to give a squared off appearance. (W) Photo by Ann Wayman

Picture #63.. H. diptera..Neat, clean, bright green, oval shaped leaves give this plant a tidy appearance. The flowers open pale mint green then turn yellow, having a light fuzz along the edges of each petal. The crown is translucent, with brownish yellow tips and a dark, rose pink center. (W) Photo by Ann Wayman

Picture #64.. H. affinis..A large flowered Hoya in the Ereostemma section. The foliage of the plants in this section are always fuzzy to some degree, The flowers are usually very waxy with a hard texture and good lasting qualities. The flowers on this Hoya are over one inch across, brownish purple in color with a yellow crown and a dark brown center. (W) Photo by Ted Green

Picture #65.. H. acuta (bronze form)..Typical acuta type flowers. The buds are a glowing bronze color. The open flowers have a pinkish bronze tint. (M) Photo by Ann Wayman

Picture #66.. H. darwinii..Comes from the Philippines, and is one of the true beauties of the Hoya world. Unfortunately this is a very difficult Hoya to grow. The leaves, as a rule, are thin and dark blue green, but it will often form large bullate leaves that are inhabited by ants in the wild. The flowers are large, iridescent, pinkish mauve in color, with a pure white crown and a dark rose red center. The crown sits very prominently on top, like a queen's tiara. (W) Photo by Rex Elliott

Picture #67.. H. fungii..Described on page 72. (M) Photo by Henry Raphael

Picture #68.. H. pubicalyx var. Chimera..Described on page 89. (M) Photo by Ann Wayman

Picture #69.. H. Sp. Gold Star..Another very large Hoya of the Ereostemma section. The leaves are slightly fuzzy, and medium green in color. The flower is one and one half inch or more across, very hard and waxy in texture, and a delightful golden yellow in color. The crown is also golden yellow. (W) Photo by Bob Stone

Picture #70.. H. carnosa cv.'Krinkle 8'..One of the more decorative cultivars that has appeared in recent years, and among the very best! The foliage is thick and quite succulent, dark, glossy green with indentations on each side of the mid-vein. The medium sized carnosa type flowers are either pure white with a red center or can be various shades of pink. The growth pattern of this plant makes it a winner. The close leaved branches grow rapidly, into long, cascading waterfalls of deep green. There is also a gorgeous, variegated form of this plant. (C) Photo by Ann Wayman

Picture #71.. H. sp. BSI-1..These large, slightly cup shaped, pinkish purple flowers virtually sparkle. The crown is pure white with a deep red center. The leaves on this plant are not very thick but are quite large, and an attractive, dark blue green in color. The open flowers have a luscious grape fragrance. (W) Photo by Bob Stone

Picture #72.. H. sp. Sabah Malaysia..This species appears to be in the Hoya acuta complex. It has earned a place in our Hall of Fame because of its fantastic blooming qualities. It flowers practically year round, with dozens of umbels open at a time. The flowers are small, white, and very waxy. It has a mild honey fragrance. (M) Phoyo by Ann Wayman

Picture #73.. H. archboldiana..These bowl shaped flowers are two inches across, and this particular clone is rose red inside the bowl with a cranberry red corona. The outside of the bowl is light emerald green. The leaves are very large, and such a dark green that they appear black. The fragrance of these flowers is spellbinding. (W) Photo by Ann Wayman

Picture #74.. H. sp. WMZ..This is an unidentified, velvet leaved plant from New Guinea. The pure white flowers are very large, up to two and a half inches across, slightly bowl shaped, and have a huge lime green calyx with a red edge. Another wonderfully fragrant Hoya. (W) Photo by Ann Wayman

Picture #77.. H. naumanii..The identity of this plant is doubtful. Whatever it is, it's a real beauty, with one inch, pale pink flowers having a darker pink at the base of each petal, and shading to light rose near the tips. The crown is pure white. (W) Photo by Ann Wayman

Picture #78.. H. nummularioides..Described on page 81. (C) Photo by Ann Wayman

Picture #79.. H. coriacea..Large blue green leaves have a soft quilted texture. These huge umbels, often consist of 50 or more golden yellow flowers, with long silky hairs on the petals. The crown is very waxy and pure white to pale pink with a mauve center. (W) Photo by Ann Wayman

Picture #80.. H. carnosa..One of the oldest, and best known of all the Hoya species..It remains, one of the very best. (C) Photo by Ann Wayman

Picture #81.. H. plicata..Described on page 86. (M) Photo by Ann Wayman

Picture #82.. H. motoskei..The Hoya specimen that was described, named H. carnosa and placed in herbariums in the year 1802 belonged to this species...thereby making this the "true" Hoya carnosa. This clone goes by the name of "Snowball" because of the pure white, ball shaped clusters of flowers. The leaves of this plant are dark green, and quite thick and succulent with a short fuzz on the backside. It has an overpowering honey fragrance. (C) Photo by Ann Wayman

Picture #83.. H. pubicalyx cv. 'Dapple Gray'..This plant has the typical silver and pink spattered leaf of pubicalyx, but also has some areas of gray blotches. The large flowers are a gorgeous shade of rosè wine, with silvery or light gray fuzz around each petal edge. Nice fragrance, and a very heavy bloomer. (M) Photo by Ann Wayman

Picture #84.. H. carnosa 'Krimson Queen'..All Hoyas have attractive green foliage. This is a stunning variation with dark blue green centers and edged in pink, white or sometimes yellow. Often these colors are all found on the same plant. (C) Photographer unknown

Picture #85.. H. australis ssp. sanae..A desert form of Hoya australis with extremely thick, succulent leaves. (M) Photo by Ann Wayman

Picture #86.. H. meliflua..Described on page 79. (W) Photo by Ann Wayman

Picture #87.. H. macgillivrayi..Described on page 77. (W) Photo by Ann Wayman

Picture #88.. H. megalster..Described on page 78. (W) Photo by Ann Wayman

Picture #89.. H. linearis..The very odd shaped leaves of this species from India seem to disguise the fact that this is actually a Hoya, however when the small white flowers open, there is no denying that this is indeed a Hoya. The leaves on

this plant are two to three inches long, straw thin, and covered with long, velvety hairs. The leaves droop lazily from thread-like stems. Aphids don't normally bother this plant, nor do mealy bugs. It is, however "spider mite" heaven, and it is suggested that this plant be sprayed weekly with a diluted alcohol solution to keep the mites at bay. If you can keep the mites off this plant, it can grow to four feet long or more in one season. (M) Photo by Carla McGavran

Picture #90.. H. Sp. USDA 354239..A beautiful plant in the Hoya nicholsoniae complex. The leaves are heavily veined, and the foliage turns mahogany brown in bright light. The flowers are pale mint green with a white crown. (M) Photo by Ann Wayman

Picture #91.. H. sp. Kuching, Borneo (#ML 232)..This is a beautiful little plant collected in Borneo. The foliage is very similar to H. lacunosa, but there the similarities end. The flower is pure white with a dark cranberry red crown. The petals do not reflex backwards, but instead are pushed upwards at the base from a small ridge underneath. This makes the crown appear sunken, and surrounded by tiny white pillows. Only the petal tips curl under. Wonderfully fragrant. (W) Photo by Ann Wayman

Picture #92.. H. archboliana (pink form)..This is merely another color variation to H. archboldiana (picture #73), being a lovely dusty rose around the top of the bowl. The center inside is startling white, the crown is cranberry red. The bowl on the outside is white to pale pink. The foliage on this plant is smaller and not as dark as the red form. It is not unusual for this plant to have two hundred or more flowers open at once. (W) Photo by Ann Wayman

Picture #93.. H. chlorantha var. tutuilensis..This pretty species comes from Tutuila in American Samoa. The leaves are thin and lance shaped, the stems are thread-thin and wiry. The fuzzy flowers on this species are rather small but impressive, being yellowish brown, and marbled with rose colored streaks throughout each petal. The crown is reddish brown. (W) Photo by Ann Wayman

Picture #94.. H. sp. Bangkok Red..An unidentified species from Thailand. The flowers of this species are pure white, including the crown, and have the appearance of being carved from wax. The foliage of this plant makes it a worthwhile addition to collections. The leaves are very thick and succulent, and will turn a gorgeous, shiny, cordovan brown or sometimes dark maroon in bright light, hence the name "Bangkok Red". (W) Photo by Ann Wayman

Picture #95.. H. eitapensis..This small growing, basket plant comes from New Guinea, and has pure white flowers, slightly fuzzy on the edges of the petals, and a yellow center. It is difficult to tell which way is up on this species, as the foliage

has an unusual growth pattern, and appears to be growing upside down. The leaves are a lovely olive green and turn pinkish brown in bright light. (W) Photo by Ann Wayman

Picture #96.. H. kentiana..This species has long, thick, stringbean shaped foliage, the sides curve upwards forming a crease down the center. The flowers are small, and the very fuzzy, rose colored petals recurve backwards to form a ball. The crown is red, or reddish purple, and sits atop the curved petals like a tiny pagoda. (M) Photo by Ann Wayman

Picture #97.. H. sussuella (ariadna)..The identity of this species is not certain, however, 'ariadna' is the name the plant is sold under by many dealers. It is a species in the Ereostemma section, has slightly fuzzy leaves and stems when young, turning hairless with age. This plant is a real challenge to bloom, but worth the effort. The flowers are magnificent! Very large and waxy, burnt orange in color with a golden yellow crown, and a dark brown stain at the base of each coronal lobe. The flowers open out flat, the bases of the petals are pushed up around the crown from a ridge underneath and the sides and tip end of the petals curl under slightly. (W) Photo by Ann Wayman

Picture #98..H. sp. DAV-817..This species is identical to the plant pictured in frame #71..BSI-1. It is shown here again, due to the fact that it is being sold under both numbers. It is also sold under the name H. subcalva. Hopefully there will be a proper identification for this beautiful species soon. (W) Photo by Ann Wayman

Picture #99.. H. erythrostemma..A ballet dancer in a lacy white tutu, would be an ideal description of this gorgeous Malaysian species. The foliage of this plant is so similar to Hoyas in the acuta complex, that many people were fooled for several years, thinking it was just another Hoya acuta. The story goes, that even as the buds formed, it was realized that this species was something extraordinary. These very unique flowers are breathtakingly beautiful. Pure sparkling white, very fuzzy or lacy petals topped by a rich, ruby red crown. The individual flowers are medium sized, but the umbels consist of 40 to 50 each, forming a flower cluster approximately three inches across. (M) Photo by Ann Wayman

Picture #100.. H. dimorpha..It is uncertain whether this is the proper identification for this plant. The flower umbels are quite large and consist of 35 to 40 medium sized, golden yellow flowers with a lot of white fuzz on each petal, the crown is pure white. The foliage is dark blue green, the stems are thin and wiry. (M) Photo by George French

Picture #101.. H. incrassata..There are many clones of this Philippine species being distributed. The leaves on some are long, rather thin and oval shaped,

others have almost round, thicker leaves. The flowers on all these clones appear to be the same, with maybe some being only a little larger than others. This is an extremely easy plant to grow and flower. The individual flowers are quite small, very waxy, and golden yellow with dark brown petal tips that reflex sharply backwards. The crown is white. This species has a lovely, mild, spice fragrance. (W) Photo by Ann Wayman

Picture #102.. H. multiflora..A gorgeous, blue/green foliaged clone from the Philippines. The soft, mint green color of these flowers and the petals that lay out almost flat, are the distinguishing feature that sets this plant apart from the other clones of multiflora. It flowers off and on throughout the year, with its heaviest concentration of blooms appearing in early spring. (W) Photo by Ann Wayman

Picture #103.. H. sp. Sabah Malaysia (IML #557)..Although this species remains unidentified at this time, no collection should be without this beautiful little plant. It would be considered a semi miniature, and perfect for the light garden, or window sill growing. The leaves are approximately three inches long and pointed at both ends, emerald green in color with spots and streaks of white and brown. The flowering umbel consists of 25 to 30 medium sized flowers whose petals are dark, dusty rose with a light overlay of soft white hair. The crown is sparkling ruby red, rather large, and sits atop of the petals like a Chinese pagoda. (M) Photo by Ann Wayman

Picture #105.. H. caudata var. crassifolia..A very close-up shot of the same delicate blossoms that are featured in picture #47. Shown here again to emphasize these exquisite, lace-like flowers. (M) Photo by Rex Elliott

Picture #106.. H. sp. Bogor.. This plant has been tentatively identified as H. pallida, but is being considered for further study. The leaves of this plant have very rigid acuta type leaves, but with small indentations on top along the mid-vein. The flowers are small to medium sized and are coppery pink including the crown, and has a dark pink center. Strong honey fragrance. (M) Photo by Ann Wayman

Picture #107.. H. sp. DAV-819..A species collected in the Solomon Islands and tentatively identified as H. cominsii. The stunning foliage of this plant is slightly heart shaped, emerald green and heavily net veined in white. The flowers are medium sized and open a lovely mint green, fading gradually to light creamy yellow with a startling pure white crown. The petals turn under on the tips and sides to produce a squared off appearance. (W) Photo by Ann Wayman

Picture #108.. H. serpens..A particularly elegant technique for growing H. serpens is on a moss covered log. The moss must be kept moist at all times, and a light daily misting with a hose or spray bottle is recommended. (M) Photo by Ann Wayman

Picture #109.. H. sp. New Guinea White..Another velvet leaved species from the island of New Guinea. The flower is large, slightly cup shaped, and pure white. The only other color on this flower is just the barest hint of red underneath the waxy white crown. A nice, but almost overpowering fragrance accompanies the opening of these flowers. Very difficult to bring into first bloom, but an easy bloomer once it gets started. Also sold as USDA #354244. (M) Photo by Carla McGavran

Picture #110.. H. globulosa..Many collectors have this plant incorrectly labeled as H. bandaensis. The foliage of this species is simply gorgeous, dark emerald green, with even darker marbled veins that are often quite fuzzy. It's reported to be very difficult to flower in the U.S. but some growers here who grow them outdoors have great success with blooming. The flowers are medium in size, pure white to soft, creamy yellow, with a hint of pink under the white crown. They form huge umbels that are perfect spheres, or globe shaped, hence the name 'globulosa'. This is also one of the few Hoyas that is described as having a rather foul odor. (C) Photo by Chuck Everson

Picture #111.. H. imperialis var. rauschii..An aptly named Hoya, in that it is fit for a king! The flower umbels usually consist of 6 to 8 large, slightly cup shaped flowers up to three inches across, and can be any shade of coppery pink to brownish red with a pure white crown. This variety has large, slightly wavy, dark green foliage. (W) Photo by Henry Raphael

Picture #112.. H. densifolia..It is not certain whether this is the correct identity for this plant. It appears to match the drawings and descriptions in the literature. The flowers seem identical to those of H. cumingiana, at least to the naked eye. The foliage is also similar but longer, thinner and the internodes are farther apart. It blooms more freely than cumingiana. (W) Photo by Ann Wayman

Picture #113.. H. pentaphlebia..Described on page 85. (W) Photo by Ann Wayman

Picture #114.. H. carnosa variegata..A typical carnosa type flower, usually light to dark pink, and with a dark red center. The spectacular foliage of these variegated type plants are their major attraction. The new growth is normally dark purple or maroon, but soon begin to turn different colors as they age. Fully mature leaves can be green and white, green and pink, green and yellow, or display all of these colors at once, with an occasional branch displaying solid

white or solid pink leaves. These white and pink leaved branches don't normally live very long as they have no chlorophyll, but enjoy the contrast for a few weeks, then cut them out to preserve the strength of the rest of the plant. Any solid green branches should also be removed as they are stronger, with an abundance of chlorophyll that will eventually turn the entire plant solid green. (C) Photo by Ann Wayman

Picture #115.. H. fraterna..Described on page 28. This photo arrived labeled H. fraterna, however, based on the foliage that is visable in the background, it appears to be a photo of H. meliflua. The flowers of these two species are identical (at least to the naked eye), and the only apparent difference is in the size of the leaves. (M) Photo by Henry Raphael

Picture #116.. H. diversifolia B..The plant pictured here, has been called by this name for years. No one knows for sure what species it is, though it has been recognized that it is not a part of the diversifolia family complex, and it's uncertain whether it has ever been published. No literature has ever been found that totally matches the description of this plant...leaves that approach the size of a dinner plate, very thick and rigid, splashed liberally with white or silver, sometimes with gray. The stems of this plant are immense and with age, can reach the diameter of a broomstick. The bloom spurs (peduncles) are purple, usually about 3 to 4 inches long, 1 inch or more in diameter, becoming thicker toward the flowering end, very rigid, and grow straight up. The individual flowers are small to medium in size with up to 60 or more in each cluster, forming an umbel of white or pale yellow flowers as large as a softball. Smells nice. Very good bloomer! (M) Photo by George French

Picture #117.. H. mitrata..A real odd-ball! The foliage of this plant grows in streaks and spurts of tightly packed, cabbage-like leaves, then a section of long internodes with the leaves spaced out over several feet of stem, then another batch of tightly packed cabbage-like leaves. The flowers normally grow out of the center of the tightly packed leaves, and are small but spectacular in appearance as the petals reflex sharply and force the tall crown to protrude even more dramatically. The name mitrata, in fact, means turban-like, and is a suitable name for this species. (M) Photo by Ted Green

Picture #118.. H. curtisii/pruinosa..The name of this plant is written here in this manner because at this point it is being sold under both of these names. No matter what name it eventually winds up with, this is a priority plant for every Hoya collector. It is an absolute darling, with tiny, thick, silver splashed leaves and an abundance of adorable, sharply reflexed, creamy yellow, or buff colored flowers with a high crown and a red center. (M) Photo by Ted Green

Picture #119.. H. pubera..Another Hoya whose identification needs more study. This plant was sold for several years with the name of H. bilobata "Ben Hardy"

and was thought to have been collected in Java. The leaves are dime sized ovals of dark green. The flowers are extremely small, and difficult to see with the naked eye. Only through the use of a magnifying glass, or a high powered macro lens of a camera do the intricate details of these tiny flowers become visible. (W) Photo by Ann Wayman

Picture #120..Gorgeous variegated foliage of an H. carnosa clone with the "common name" of Suzie Q. (C) Photo by Chuck Everson

Picture #121..A full basket of H. obovata foliage. Photo by Chuck Everson

Picture #122..H. obscura..Showing some mahogany colored leaves. Winter sun will turn this entire plant a beautiful cordovan brown with white veins and green leaf margins. (W) Photo by Ann Wayman

Picture #123.. H. carnosa..Dark blue green leaves sprinkled with silver or white is another form of variegation in this interesting plant genus. (C) Photo by Chuck Everson

Picture #124.. H. kerrii, the sweetheart Hoya with a twist. Gorgeous golden yellow variegation in various patterns adorns the leaves of this recently collected plant from Thailand. (M) Photo by Chanin Thorut

Picture #125..A spectacular basket of Hoya bella with hundreds of umbels of flowers open. (M) Photo by Ann Wayman

Picture #126.. H. purpureofusca..The big, the bold and the beautiful!. Foliage of a young plant of H. purpureofusca is shown here for comparison to the plant of H. pubicalyx cv. 'Pink Silver' (the pink silver vine) that many growers still have in their collections incorrectly labeled with this name. (W) Photo by Ann Wayman

Picture #127.. H. ciliata..One of the more spectacular Hoyas, especially in regards to color. This species is called the "Black Hoya" for obvious reasons. The foliage is soft and velvety, the flowers are such a deep purple that they appear to be black. They have a golden yellow crown and a deep purple center. (M) Photo by Ted Green

Picture #128.. H. chlorantha.. Unlike the variety tutuilensis (Picture #93), these flowers are greenish white with a darker green center that extends almost to the ends of each petal tip. Thin wiry stems with dark green, lance shaped leaves. (W) Photo by Ted Green

Picture #129.. H. lanceolata..Practically identical to H. bella, but with long, lance shaped, lacy looking foliage. The flowers are pure white. The translucent crown has a dusty rose tint, with dark rose coloring on the tips and base of each coronal lobe. (M) Photo by Ted Green

Picture #130.. H. imbricata..A weird but wonderful Hoya species with a most unusual growth pattern. The word imbricate means overlapping shingle fashion, and is a perfect description of the manner in which these leaves grow. The stems start out with a pair of round, opposite leaves, but one leaf is smaller and aborts, or dies off. The remaining leaf develops roots at the node and clings tightly to its support. A new stem begins to grow from this point, and a new pair of opposite leaves form very close, and slightly overlapping the older leaf...aborts one, and the process goes on and on. The flower clusters consist of 20 or so very tiny ball shaped flowers that are pale yellow with white fuzz on the petals. The crown is golden yellow with long white stamens coming out of the center. (W) Photo by Ted Green

Picture #131.. H. guppyii..Dark, emerald green buds open to reveal gorgeous, saucer shaped, maroon colored flowers that are 1 inch or more across with a white crown. The under side of this flower remains emerald green, producing a startling impression. Foliage is slightly fuzzy, as are all Hoyas in this Eriostemma section. (W) Photo by Ted Green

Picture #132.. H. sp. USDA #354241..Another candidate for the wax museum. The large, saucer shaped flowers are an iridescent, reddish brown color that have the appearance of being buffed to a high shine. The crown is yellow with the coronal lobes being almost completely round, and with a dark brown stain at their base. The foliage is medium gray/green and slightly fuzzy. (W) Photo by Ted Green

Picture #133.. H leucorhoda..A compact growing plant with clean looking, glossy green, slightly heart shaped foliage. The flowers are medium sized, white or buff colored and have a very waxy, golden yellow crown with a dark brownish orange center. This is a neat plant! (W) Photo by Ted Green

Picture #134.. H. australis ssp. rupicola..A small growing plant from Australia. This species grows in the sandy desert among rocks. It does not twine, but sprawls and scrambles across nearby rocks and boulders. The name 'rupicola' means "rock dweller". (M) Photo by Ann Wayman

Picture #135.. H. ruscifolia..The identity for this plant is doubtful. The foliage is practically identical to the plant we call H. bilobata (not at all like the leaves of ruscus, or "The Butcher's Broom" that the plant is supposed to resemble). The flowers are very tiny. (W) Photo by Ann Wayman

Picture #136.. H. Sp. New Guinea Gold..Another very large, very waxy species in the Eriostemma section. As the name suggests, the flowers are a gorgeous golden yellow. (W) Photo by Bob Stone

Picture #137.. H. Sp. USDA 354246..A Hoya nicholsoniae with copper colored flowers and darker, coppery pink stripes down each petal. The foliage also has copper tones. (M) Photo by Ann Wayman

Picture #138.. H. engleriana..A true miniature plant with leaves that resemble green colored grains of rice. The flowers are quite large for such a small plant, pure white and with a dark crimson red crown. Many people are still getting H. serpens with this name on the label. (M) Photo by Ann Wayman

Picture #139.. H. motoskei..A hanging tomato cage is a lovely treatment for this old and reliable friend. (C) Photographer unknown

Picture #140.. H. sp. HSI #458..A full view of this darling little plant, and it's foliage. (M) Photo by Henry Raphael

Picture #141.. H. multiflora..A clone with gorgeous variegated foliage has arrived on the scene. (W) Photo by Bob or Margie Stone

Picture #142.. H. nicholsoniae..This clone has been sold for many years as the small leaved H. cinnamomifolia. It is not related to that species, nor does it resemble it in any way. The flowers are waxy, and have a definite tan or brown tint to them. The foliage turns a gorgeous mahogany color in winter sun. (M) Photo by Ann Wayman

Picture #143.. A grouping of Hoya plants at the County Fair, including a variegated Indian Rope Hoya, and a basket of H. megalaster with 3" blooms. Photo by Jim Wayman

Picture #144.. H. carnosa..The old fashioned "wax vine". This species has been in cultivation in this country for a hundred years or more, and is just as popular today as it was back in Grandmothers time. How long can a Hoya live? This question is answered in part, by this 25 year old plant which has had close to 1000 cuttings taken for propagation over the years. Photo by Ann Wayman

THE PICTURE GALLERY

H. pulchella

{1} H. australis

{2} H. lacunosa

{3} H. arnottiana

{4} H. pubicalyx 'Fresno Beauty'

{5} H. kenejiana

{6} H. multiflora

{7} H. kerrii

{8} H. serpens

{9} H. acuta (Green Form)

{10} H. sp. tanna

{11} H. pachyclada

{12} H. sp. Bangkok # 4

{13} H. obovata

{14} H. obovata (Foliage)

{15} H. fuscomarginata

{16} H. Mini Belle

{17} H. Sp. HSI # 458

{18} H. diversifolia ʙ.

{19} H. polystachya

{20} H. sp. Chiang Mai

{21} H. loherii (Foliage)

{22} H. loherii

{23} H. sp. F-484

{24} H. littoralis

{25} H. compacta

{26} H. calycina

{27} H. obscura

{28} H. pubicalyx 'Red Buttons'

{29} H. pubicalyx 'Bright One'

{30} H. ischnopus

{31} H. bella

{32} H. nicholsoniae # IML 37

{33} H. shepherdii

{34} H. citrina

{35} H. sp. CI-1244

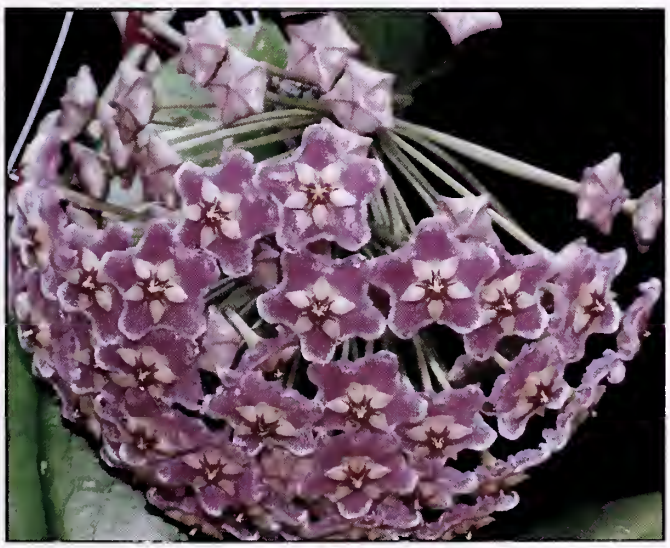
{36} H. nicholsoniae # IML 39

{37} H. cinnomomifolia

{38} H. cumingiana

{39} H. gracilis

{40} H. neoebudica



{41} H. pubicalyx 'Pink Silver'

{42} H. padangensis

{43} H. sp. PNG 4

{44} H. camphorifolia

{45} H. inconspicua

{46} H. purpureofusca

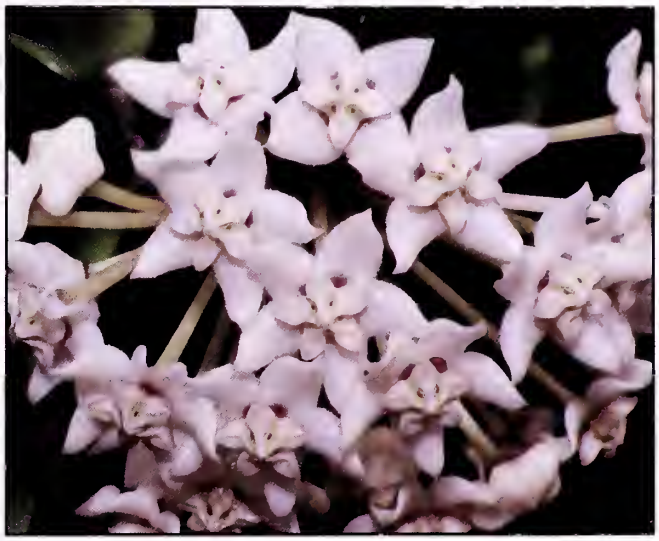
{47} H. caudata var. crassifolia

{48} H. odorata

{49} H. sp. PNG 1

{50} H. pottsii

{51} H. erythrina



{52} H. sp. IML 33

{53} H. diversifolia

{54} H. pseudolitoralis

{55} H. limoniaca

{56} H. sp. CMF-8

{57} H. bilobata

{58} H. micrantha

{59} H. sp. PNG 6

{60} H. poolei

{61} H. tsangii

{62} H. merrillii

{63} H. diptera

{64} H. affinis

{65} H. acuta (Bronze)

{66} H. darwinii

{67} H. fungii

{68} H. pubicalyx 'chimera'

{69} H. sp. Gold Star

{70} H. carnosa 'Krinkle 8'

{71} H. sp. BSI-1

{72} H. sp. Sabah Malaysia

{73} H. archboldiana (Red Form)

{74} H. sp. WMZ

{75} H. finlaysonii

{76} H. polyneura

{77} H. naumanii

{78} H. nummularioides

{79} H. coriacea

{80} H. carnosa

{81} H. plicata

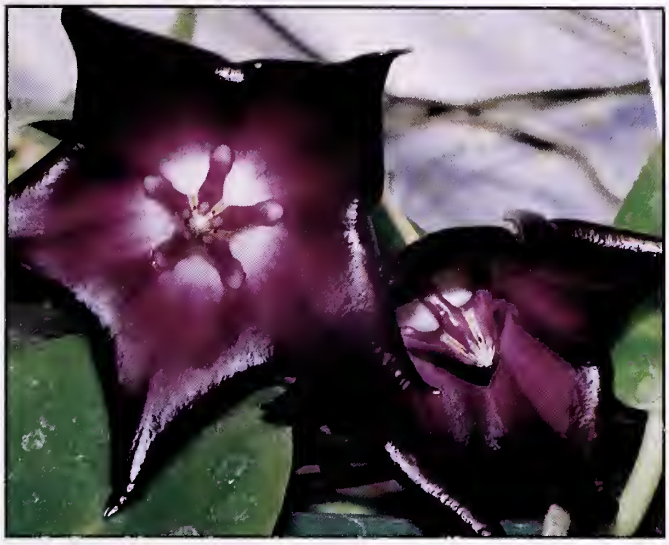
{82} H. motoskei

{83} H. carnosa 'Dapple Gray'

{84} H. carnosa 'Krimson Queen' (Foliage)

{85} H. sanae

{86} H. meliflua



{87} H. macgillivrayi

{88} H. megalaster

{89} H. linearis

{90} H. sp. USDA # 354239

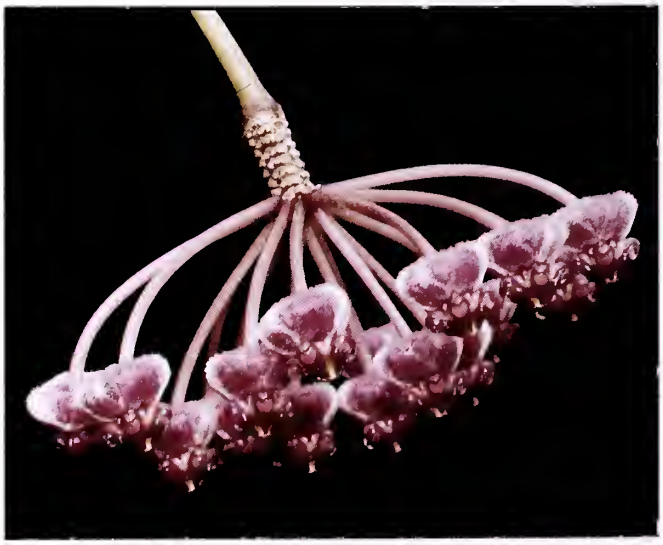
{91} H. sp. Kutching Borneo IML 232

{92} H. archboldiana (Pink Form)

{93} H. chlorantha var. tutuilensis

{94} H. sp. Bangkok Red

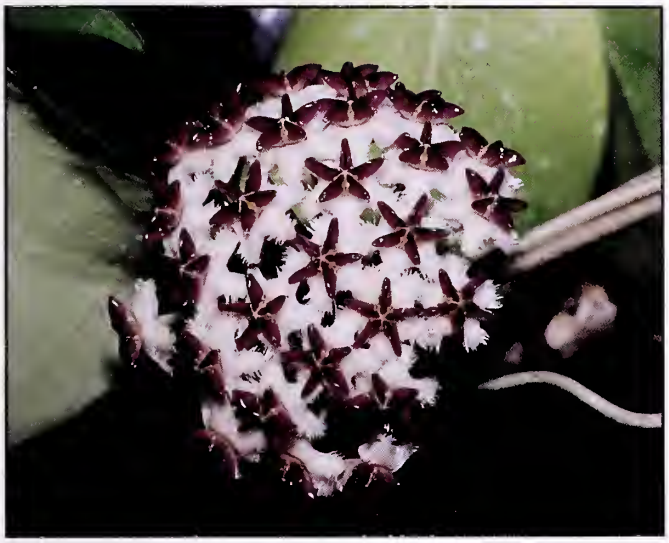
{95} H. eitapensis



{96} H. kentiana

{97} H. sussuella (ariadna)

{98} H. DAV-817



{99} H. erythrostemma

{100} H. dimorpha

{101} H. incrassata

{102} H. multiflora (Philippines)

{103} H. sp. Sabah Malaysia IML 557

{104} H. pauciflora

{105} H. caudata var. crassifolia

{106} H. sp. Bogar

{107} H. sp. DAV-819

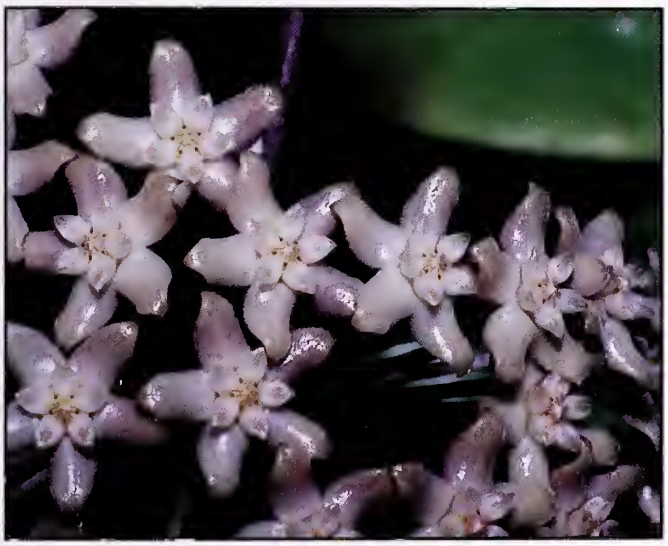
{108} H. serpens (growing on log)

{109} H. sp. New Guinea White

{110} H. globulosa

{111} H. imperialis

{112} H. densifolia



{113} H. pentaphlebia

{114} H. carnosa variegata

{115} H. fraterna

{116} H. diversifolia B

{117} H. mitrata

{118} H. curtisii/pruinosa

{119} H. pubera

{120} H. carnosa 'Suzie Q'

{121} H. obovata (Foliage)

{122} H. obscura & foliage

{123} H. carnosa (Foliage)

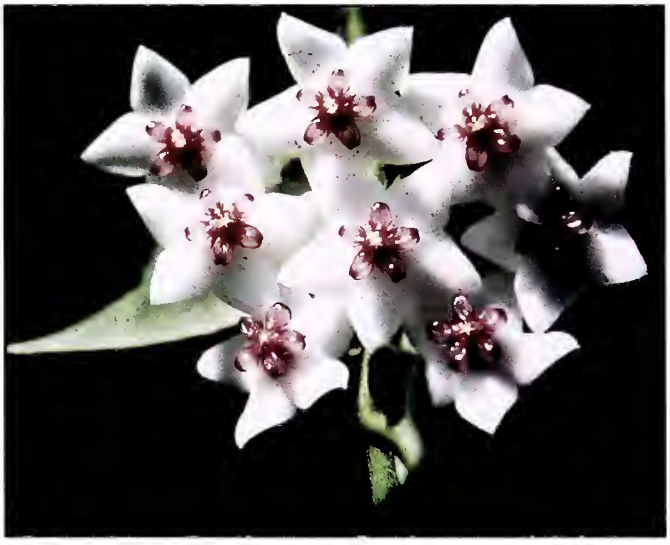
{124} H. kerrii (Variegated)

{125} H. bella

{126} H. purpureofusca

{127} H. ciliata

{128} H. chlorantha



{129} H. lanceolata

{130} H. imbricata

{131} H. guppyii

{132} H. Sp. USDA # 354241

{133} H. leucorhoda

{134} H. australis ssp. rupicola

{135} H. ruscifolia

{136} H. Sp. New Guinea Gold

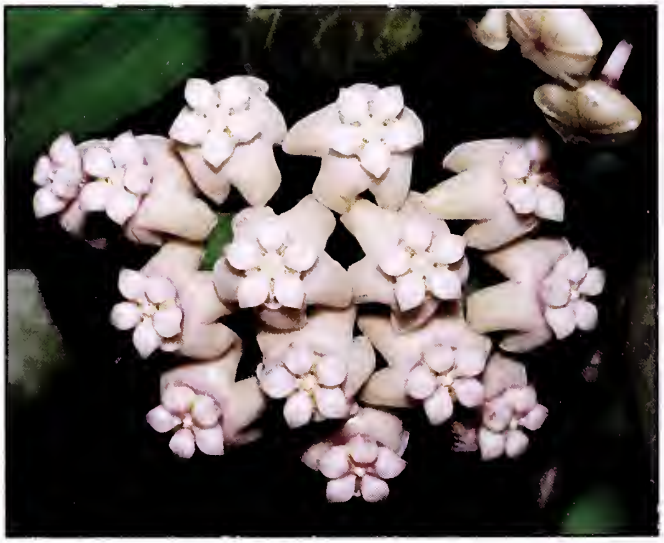
{137} H. Sp. USDA # 354246

{138} H. engleriana

{139} H. motoskei

{140} H. Sp. HSI-458

{141} H. multiflora (variegata)



{142} H. nicholsoniae

{143} H. compacta & megalaster

{144} H. carnosa

Glossary

Acid...A reference to a pH level below 7.0. Acidity is an indication of the absence of lime in potting mix or water.

Active growth period...The period when a plant begins to put on new growth, increases in size, and generally produces flowers.

Alkaline...A reference to a pH level above 7.0. Alkalinity is an indication of the presence of lime...The opposite of acid.

Alternate...A reference to the placement of leaves on a stem. Alternate leaves are borne singly at different heights, more or less alternating from one side of the stem to the other.

Anther...The part of a flower that produces pollen (the male sex cells).

Axil...The angle between a leaf or leafstalk and the stem that carries it.

Bigeneric...A reference to a hybrid plant originating from the crossing of parents from two distinct genera.

Calyx...The outermost part of a flower. The calyx is usually green, and has a tough leathery consistency that protects the developing flower within.

Chlorosis...A nutritional deficiency in plants that results in leaves becoming sickly yellow or white but even the tiniest veins will remain green.

Compound...Usually a reference to leaves that are divided into two or more segments.

Corolla...The petals of a flower. Usually the most highly decorative and colorful part of a flower.

Cultivar...Normally a variety of plant that has originated in cultivation rather than in the wild. The names of cultivars are generally written in modern language (not Latin), and are correctly enclosed within single quotation marks.

Cutting...A portion of stem, usually with leaves left intact, that is removed from a plant and treated in such a way as to produce new roots and eventually grows into a new plant.

Epiphyte...A type of plant that uses the branches and bark of other plants as a growing site. Epiphytes do not feed off of their host plant, so are not parasitic.

Flower...The plant organ that is specialized for sexual reproduction, in which pollen from the male part (the stamen) is transferred to the ovaries of the female part (pistil) so that fertilization takes place and seed develops.

Globose...A ball or globe shape. In Hoyas, globose refers to the perfectly round shape of some flower umbels.

Inflorescence...A general term for the flowering part of a plant. Most commonly used in reference to flowers that form in umbels or clusters.

Latex...A milky sap produced by many plants but most notable in the Asclepiadaceae or milk weed family.

Margin...In plants the word margin is most often used to describe the border or edge of a leaf.

Midrib...The central rib of a leaf, which generally projects out from the leaf surface, runs its length, and divides it into equal halves.

Opposite...A reference to the placement of leaves on a stem: The leaves are borne in opposite pairs along the length of the stem.

Palmate...Literally "hand shaped". In Hoyas this term is generally applied to the prominent hand shaped vein patterns of some leaves, and not to the shape of the leaf itself.

Petiole...The leafstalk or stem by which leaves are attached to the plant.

pH...Literally, the hydrogen-ion concentration in soil, potting medium, water etc. The pH scale is used as a means of measuring the acidity or alkalinity of any of these substances. The scale extends from 0 to 14, with pure water at a pH of 7.0 as the standard. Above 7.0 is considered alkaline, below 7.0 is considered acid.

Pistil...The female organ of a flower, consisting of an ovary, a stigma and a style.

Root ball...The mass of roots and potting medium that are held together when removed from a container by millions of tiny hair roots.

Sessile...Without a stalk. A reference to leaves or flowers that arise directly from the plant stem.

Spur...In Hoyas the term refers to the short flowering branches, or peduncles that remain on the plant through several seasons and continue to flower time after time from the same location

Stomata...The microscopic breathing pores of plants. Usually on the undersides of leaves.

Succulent...Plants that have fleshy stems and leaves that can function as water storing receptacles.

Undulate...With wavy up-and-down margins. This term is normally applied to leaves, but can also be used to describe wavy flower petals.

Variegated...A reference to leaves (sometimes flowers) that are a combination of two or more colors in a splashed, striped or spotted pattern.

Variety...A plant that is different from the normal type species. The reference to variety as used by modern botanists, refers to variations that have originated in the wild. However, the word is frequently applied to variations arising in cultivation, which should technically be called cultivars. Names of true varieties are correctly written in Latin and are not enclosed in quotation marks.